DOCUMENT RESUME

ED 155 860 EC 110 741

AUTHOR Reynolds, Robert N.; And Others
TITLE Pennsylvania Looks at Special Education: A Two Year Report. Includes Summary.
INSTITUTION Pennsylvania State Dept. of Education, Harrisburg.
PUB DATE Apr 78
NOTE 91p.; For the first year report, see ED 132 770 ; Parts of document may be marginally legible due to small type

EDRS PRICE MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS *Academic Achievement; Educable Mentally Handicapped; Elementary Secondary Education; Emotionally Disturbed; Exceptional Child Research; Followup Studies; Handicapped Children; Instructional Student Costs; Mentally Handicapped; Neurologically Handicapped; Physically Handicapped; *Program Costs; *Program Effectiveness; *State Programs; Trainable Mentally Handicapped
IDENTIFIERS *Pennsylvania

ABSTRACT

The 2-year study reports on student progress, quality of instructional programs and costs for five groups of 7,000 exceptional students in Pennsylvania; educable mentally retarded, trainable mentally retarded, physically handicapped, socially and emotionally disturbed, and brain injured. Instruments are said to have included the Wide Range Achievement Test, the Vineland Social Maturity Scale, the Indicators of Quality test for program evaluation, and budget line-item figures for program cost. Among conclusions discussed are that children in the sample did make significant progress in the areas assessed; the average daily membership (ADM) costs ranged from about two to three and one-half times as much as the ADM costs for equivalent regular education students. Nearly half the report is comprised of five appendixes, such as correlation matrices for individual categories of exceptionality. (CL)

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PENNSYLVANIA LOOKS AT SPECIAL EDUCATION: A TWO-YEAR REPORT

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April 1978

EC110741

I228

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ACKNOWLEDGEMENTS

The authors extend grateful appreciation to the special education directors, teachers, supervisors, psychologists and administrators who participated in this study. Guidance from Seon H. Cho, director, Bureau of Information Systems; Philip Mulvihill, assistant director, Bureau of Information Systems; Gary Makuch, director, Bureau of Special Education and William H. Ohrtman, special assistant for policy and liaison, Bureau of Special Education is also gratefully acknowledged.

The primary members of the PDE research task force were Albert DiJohnson, John Cober and Robert Reynolds. Other PDE researchers who aided were George Brehman, James Masters, Gregory Shannon, Alfonzo Zawadski, Robert Goldberg, William Donny, Russell Dusewicz, Grace Laverty, Barbara Davis, Agnes Martinko and James Dorwart.

We also extend sincere appreciation to these consultants: William W. Cooley, Joseph L. French, Richard A. Rossmiller, Harold E. Mitzel, Jack W. Birch, Harold Delp, Daniel Sage, Richard Scherr, John A. Abbruzzese, Robert Algozzini, Sanford Temkin, Joann Weinberger, Charles E. Wernert, Donald A. Miller, Laura W. Murphy, Barton B. Progar, Sara Tollinger, and Ronald L. Finkenbinder. In addition, we thank the following Penn State graduate students who were the raters of school quality during the first year of the study: Gail and Randall Quayle, Richard Regan, Margaret Mavretich, Ellen L. Nuffer, Alex Johnson, Kathryn F. Bryant and Deborah Smith.

Members of the research staff who capably assisted during the course of the study were Judy Kinsey, Margaret Sharp, Bruce Ley, Terry Murphy, Nancy Grissinger, Betsy Maines, Kathy Musselman and Caroline McCrone. Cynthia Patnode, who was primarily responsible for typing this report and doing the many necessary things too numerous to list, is due special thanks. Her knowledge, skill, patience and unfailing good cheer is sincerely appreciated.

Finally, special appreciation is extended to Robert B. Hayes for his guidance and assistance throughout the study.

SUMMARY

This two-year study of special education in Pennsylvania was conducted to gather information on student progress, quality of instructional programs and costs for five major categories of exceptionality. The initial, randomly-selected statewide sample, involving 480 classrooms and 7,000 children, was assessed during the 1975-76 and 1976-77 school years by several means.

First, the children in the study were assessed in the fall of 1975, the spring of 1976 and the spring of 1977 on measures of cognitive and social achievement. Second, the classroom environment and instructional process were measured with a specially-developed observer-interview rating scale. Finally, cost information for the two years of the study was gathered from special cost forms.

The data analyses indicate:

1. The students followed during the two years of the study generally made significant progress in basic cognitive skills and social maturity.

2. The level of quality of special education in Pennsylvania generally could be described as "good."

3. The per-child cost for special education, which varied widely across categories of exceptionality and, within categories, across intermediate units, ranged from two to four times as much as comparable per-child costs for regular education.

4. The meaning of the relationships among the cost, quality and student achievement variables used in the study was somewhat inconclusive, particularly in the context of statistical significance.

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I. INTRODUCTION

A. Background

The major impetus for the study reported here was a general and widespread concern about the lack of detailed information on the effectiveness, quality and relative costs of special education programs in Pennsylvania. This concern is illustrated by an excerpt from an August 13, 1975, letter from Stephen R. Wojdak, chairman of the Pennsylvania House Appropriations Committee, to John C. Pittenger, then Secretary of Education. While discussing the questions he thought should be addressed by research dealing with special education programs, Wojdak asked:

> 1. What is the effectiveness of Pennsylvania's program for exceptional children in the public schools? While the cost of Special Education has increased at a rate more rapid than any other program in the state's budget, there is virtually no information available about the effects that have been achieved on the children or their families.

In a letter of August 15, 1975, to Secretary Pittenger, Charles P. McIntosh, budget secretary of Pennsylvania, also addressed the primary motivation for this study. He wrote:

> The study was undertaken, in part, in response to this Office's request for information about the effectiveness of special education programs. My concern with these programs was occasioned primarily because of the large and increasing amounts of funds being expended on the programs and the almost total lack of information about their effect on children.

B. Objectives

Because of the various concerns about the need for detailed information on special education quality and effectiveness, the study was designed to gather information relating to the following questions:

(1) Are children in Pennsylvania's special education programs making significant progress in the areas of basic cognitive skills and social competence?

(2) What is the level of quality, on dimensions such as instructional setting and process, of special education in Pennsylvania?

(3) What are the relative costs for the five major categories of exceptionality in special education programs in Pennsylvania?

(4) Are there significant relationships among the cost, quality and effectiveness measures on Pennsylvania's special education classrooms?

II. PROCEDURES

A. Sample

The original sample selected in 1975 for inclusion in the study consisted of 480 classrooms with an estimated 7,000 children. Randomly selected by classroom, the sample was stratified according to the following variables:

(1) Category of Exceptionality

- (a) Educable Mentally Retarded
- (b) Trainable Mentally Retarded
- (c) Physically Handicapped
- (d) Socially and Emotionally Disturbed
- (e) Brain Injured (Learning Disabled)

(2) Instructional Level

- (a) elementary
- (b) secondary

(3) Demographic Categories

- (a) inner-city
- (b) other metropolitan
- (c) suburban
- (d) rural

(4) Costs

- (a) high
- (b) low

(5) Ratio of classrooms per exceptionality to total number of classrooms

Over the two years of the study, sample shrinkage inevitably occurred. Because of such factors as lack of testing due to teacher strikes, consolidation or disbanding of classes, graduation, mainstreaming and the high mobility of special education children, the sample was reduced to 300 classrooms and about 2,300 children. A more detailed description of the types of children in the sample is provided by the following descriptions and by Table 1.

Educable Mentally Retarded (EMR) - Included in this category are those retarded children with an IQ range of 55-80. Such children suffer from retarded mental development and exhibit impaired adaptive behavior in learning, maturation or social adjustment.

Trainable Mentally Retarded (TMR) - Included in this category are retarded children with an IQ range of 25-55. Their impairments are the same as those of the EMRs, but only more severe.

Physically Handicapped (PH) - This category includes those children with orthopedic disabilities and/or other mild to profound health impairments in such areas as speech, hearing or vision. These conditions are of such magnitude that they limit the educational performance and normal classroom accommodation of the child.

Socially and Emotionally Disturbed (SED) - This category includes those children whose emotional and social behavior is so atypical as to require special placement. Their deviate behavior may range from overt destruction to withdrawal from reality. These emotional difficulties can result in educational deficiencies.

Brain Injured (BI) - The children in this category are learning disabled because of deficiencies in the acquisition of basic skills, such as reading, writing, spelling and arithmetic. They may have neurological brain damage, but their learning problems are not primarily the result of mental retardation, physical handicaps or emotional factors.

TABLE 1

DESCRIPTION OF SAMPLE

	Number of Students	Average Age	Average Number Years in Special Education	Average IQ
EMR				
Elementary	573	11.58	4.18	68.73
Secondary	593	16.50	6.75	69.29
TMR				
Elementary	281	12.22	5.54	43.51
Secondary	188	17.61	9.50	40.29
PH				
Elementary	147	11.53	4.98	79.32
Secondary	83	16.80	8.35	75.25
SED				
Elementary	121	11.31	2.95	94.79
Secondary	78	15.97	3.83	90.39
BI				
Elementary	137	11.07	2.90	92.21
Secondary	107	14.66	3.99	90.97

B. Instrumentation

Basic Skills - The Wide Range Achievement Test (WRAT) was used to assess progress in basic skills for all children in the study except for TMRs. This instrument, appropriate for use with children of extremely varying ability levels, provides in a relatively short period of testing time measures of three basic cognitive skills: (1) reading, (2) spelling and (3) arithmetic.

For the TMR children the WRAT was considered inappropriate. Therefore, the TMR Performance Profile (TMR PP) was chosen for this category. This instrument uses a checklist format to allow someone familiar with the individual child, usually the teacher, to identify performance level on 240 items which assess six major areas: (1) social behavior, (2) self-care, (3) communication, (4) basic knowledge, (5) practical skills and (6) body usage. For this study, the instrument was scored to give one total indicator of performance.

Social Competency - The instrument used to assess this characteristic for all children was the Vineland Social Maturity Scale. This measure, like the TMR PP, uses a checklist format to allow someone familiar with the child to report competence on 117 items covering six areas: (1) self-help, (2) locomotion, (3) occupation, (4) communication, (5) self-direction and (6) socialization. The instrument can be scored to produce a measure of "social age."

Quality of Programs - This variable was measured by using the Indicators of Quality instrument developed especially for this study.[1] Combining both observation and interview techniques, the measure contains 38 items scored to yield four subscale scores and total summary score (see Appendix A). The four subscales are: (1) Instructional Process, (2) Instructional Setting and Programs, (3) Administrative Support, and (4) Integration with Regular Classroom.

In both years of the study, the observers/interviewers who used the Indicators of Quality measure were given common training to assure inter-judge reliability. These training sessions included familiarization with the general measure, discussion of criteria for assessing individual items, suggested interview techniques, general rating procedures and practice in actual special education classrooms not taking part in the study. No formal measure of inter-rater reliability was gathered with the first year's observers. For the second year, where four "training" classrooms were used, Kendall's Coefficients of Concordance were calculated for the subscale scores and the total score. The coefficients were .59, .85, .57, .83 and .81 respectively. All were significant beyond the .01 level.

[1]See George R. Brehman, et al., Special Indicators of Quality, Pennsylvania Department of Education, Harrisburg, 1976, for a report of the development process.

C. Data Gathering Procedures

1. Individual Student Data

The pupils involved in the study were tested three times during the two years. The initial pretesting was done during the fall of 1975, generally before the end of October. The second testing occurred between mid-April and the end of May in 1976. The third testing took place during the same time period in 1977.

Administration of the tests was conducted by IU or district staff, in most cases a staff psychologist. Decisions about specific details of administration were made by these local people familiar with their particular situations.

In most cases, the WRAT was administered by the classroom teacher, who also served as the primary informant on the Vineland. In the case of the TMR Profile, teachers were the primary sources of information. With both the Vineland and TMR Profile, however, input from sources other than teachers was gathered if necessary to assure valid judgments. In most cases parents provided this additional information.

2. Quality Ratings

Each special education classroom in the study was observed once during the 1976 year and once during the 1977 school year. During the first year of the study, the observations were performed by eight graduate students in special education. Working in teams of two, they completed a single pooled rating for each classroom observed. All observations during the first year were completed during March, April and May of 1976.

The second-year observations were performed by eight staff members from the Division of Research visiting classrooms alone and completing ratings individually. The observations during the second year were made between November of 1976 and May of 1977.

3. Costs

Form DEAS-22360T (Appendix B) was developed to obtain budget line-item costs for each type of exceptionality for elementary and secondary special education programs offered by each IU. The average daily memberships (ADMs), number enrolled, hours of instruction and number of classes for each category were also obtained.

Instructions cited the use of actual audited figures for reporting costs. The Basic Education Handbook for Special Education, marked to indicate the appropriate prorating method, was mailed with the DEAS-22360T forms to each IU special education director.

ADM figures for full-time programs were obtained by dividing the actual days' membership for all pupils by the total days in the school year. From this data the cost per ADM and the average class cost were computed.

The actual class cost was determined by substituting the actual teacher's salary for the average teaching salary.

The following budget-line items were used to determine the six cost areas for all the IU special education programs (EMR, TMR, PH, SED and BI):

(1) Special Education Administration (salaries)

0211 - principal
0212 - director of special education
0212.1 - supervisors
0212.2 - instructional advisers
0219 - clerical

(2) Instructional Salaries (teachers' and substitutes' salaries)

0213 - teachers
0213.1 - substitutes
0216 - other instructional staff

(3) Other Instruction

0218 - instructional assistant
0250 - contracted services

(4) Instructional Support (salaries)

0313 - psychologist
0412 - psychiatrist
0413 - nurses
0415 - clinical psychologist
0415.1 - psychiatrist (social worker)
0419 - clerical
0432.1 - other expense
0452 - contracted medical services

(5) Instructional Materials

0221 - textbooks
0224 - audio visuals
0225 - other
0222-0229 - supplies
0239.1 - other expenses

(6) Other Costs

0151 - contracted auditing services
0154 - contracted legal services
0159 - other contracted services
0231 - in-service training
0239 - staff travel - teachers, supervisors
0432 - staff travel - psychologists, therapists, etc.
0612 - operation and maintenance salaries
0621 - operation and maintenance supplies
0622 - fuel for building
0631 - utilities
0639 - other expenses
0643 - instructional equipment
0644 - noninstructional equipment
0831 - employe retirement
0832 - Social Security
0833 - Workmen's Compensation
0834 - employe's insurance
0835 - fire insurance
0836 - other insurance
0838 - rent
0839 - other fixed charges
0962 - supplementary feeding
1243 - instructional equipment
1244 - noninstructional equipment

District EMR class costs were obtained from the Comptroller's Office on Form 636 (see Appendix B). The budget-line items under the six cost areas were:

(1) Special Education Administration (salaries)

0211 - principals
0212 - supervisors or coordinators
0219 - clerical salaries

(2) Instructional Salaries (teachers, other professional instructional staff)

0213 - teachers
0216 - other instructional staff

(3) Other Instruction

0218 - salaries, instructional assistant
0250 - contracted services

(4) Instructional Support (salaries)

0313 - guidance and psychological personnel
0319 - clerical and other classified personnel

(5) Instructional Materials

0221, 0224 - textbooks, audio-visual aids
0225, 0222, 0229 - supplies, multimedia units

(6) Other Costs

0121 - administrative supplies
0311 - directors', coordinators', supervisors' salaries
0621 - operation and maintenance supplies
0831 - employer share of retirement
0832 - employer share of Social Security

Since school districts are not permitted to include the same budget-line items for special education under Other Costs that IUs include, Other Costs were excluded from the statistical analysis for those various cost areas.

D. Statistical Analysis

The primary focus of the study, as the questions on page 1 indicate, was descriptive. Consequently, much of the analysis consisted simply of summary statistics such as means, standard deviations, medians, range and gain scores.

The only departure from the descriptive focus was the attempt to answer the question of whether significant relationships among the three basic measures (cost, quality and student achievement) could be established. Here the statistical technique used was a variation of multiple regression called "commonality analysis." Essentially this technique, sometimes referred to as "partitioning of variance," allows a very specific determination of the amount of variance in the criterion measure which is accounted for by each individual variable, or set of variables, both uniquely and in combination with other variables. DeVito describes the technique as follows:

> The method is based on the premise that the variance of the criterion variable which is predicted from a set of correlated variables may be partitioned into the independent (unique) and combination (joint) contributions of those variables to the prediction . . . . . The unique contribution of variables can be thought of as the proportion of variance attributed to a particular variable or set of variables, above and beyond the variance accounted for by the other independent variables or sets in the regression equation. Joint contributions of variables can be thought of as the degree the overlap of correlated variables or sets are predictive of the criterion.[2]

[2]Pasquale J. Devito, Rhode Island Department of Education, "Commonality Analysis: A Practical Example," p. 18. A paper presented at the Annual Meeting of The American Educational Research Association, San Francisco, April, 1976.

III. RESULTS

This chapter is arranged so that the major topics are in the same order as the questions listed on page 1.

A. Student Progress

1. EMR

Tables 2 and 3 summarize the progress made by the EMR children over the two years of the study.

All the gains presented in Tables 2 and 3 are statistically significant beyond the .05 level. (The procedure used to assess significance of gains was a correlated t-test. Because of the large number performed, the t's are not presented in the tables.)

Of more practical significance, however, is the consistency and stability of the progress shown by these children. The results, while not totally uniform, show that the children in this sample are making progress in both social competency and in the three basic cognitive areas assessed by the WRAT. Further, the gains are stable over the two years of the study.

TABLE 2

EMR ELEMENTARY ACHIEVEMENT

Variable	Fall 1975 Mean	Fall 1975 S.D.[a]	Fall 1975 N[b]	Spring 1976 Mean	Spring 1976 S.D.	Spring 1976 N	Spring 1977 Mean	Spring 1977 S.D.	Spring 1977 N
Social Age	8.5	0.53	566	9.6	0.50	569	10.4	0.50	554
Reading	1.93	0.99	560	2.31	1.12	566	2.63	1.26	566
Spelling	1.92	0.99	558	2.26	1.11	566	2.60	1.08	566
Arithmetic	2.07	1.01	558	2.50	1.10	567	2.84	1.12	566

Variable	1975-76 Gain	1975-76 N	1976-77 Gain	1976-77 N	1975-77 Gain	1975-77 N
Social Age	1.1[c]	512	0.8	510	1.9	530
Reading	0.41[d]	516	0.36	507	0.74	525
Spelling	0.39	484	0.39	495	0.73	518
Arithmetic	0.48	498	0.38	497	0.82	524

[a] Equals standard deviation
[b] Equals number of pupils
[c] 1.1 is a one year, one month average gain in social age in the 75-76 school year
[d] 0.41 is a grade equivalent score average gain in the 75-76 school year

TABLE 3

EMR SECONDARY ACHIEVEMENT

Variable	Fall 1975 Mean	S.D.	N	Spring 1976 Mean	S.D.	N	Spring 1977 Mean	S.D.	N
Social Age	13.6	0.45	582	15.8	0.51	589	17.3	0.50	590
Reading	3.75	1.70	582	4.03	1.84	571	4.30	1.92	579
Spelling	3.70	1.31	573	3.92	1.37	569	4.24	1.51	576
Arithmetic	3.82	1.26	582	4.22	1.29	581	4.45	1.29	579

Variable	1975-76 Gain	N	1976-77 Gain	N	1975-77 Gain	N
Social Age	2.2	533	1.5	553	3.7	560
Reading	0.31	480	0.33	476	0.60	507
Spelling	0.26	417	0.45	408	0.62	456
Arithmetic	0.47	465	0.30	457	0.74	476

2. TMR

Tables 4 and 5 summarize TMR student progress over the two years of the study.

Again, all the gains presented, and even the regression shown in Table 5, are statistically significant beyond the .05 level. Here, however, the pattern of stable progress is disrupted somewhat by secondary pupils' slight decline in Social Age during the second year of the study. Despite speculation about the reasons for the decline, it is difficult to explain satisfactorily.

TABLE 4

TMR ELEMENTARY ACHIEVEMENT

Variable	Fall 1975 Mean	S.D.	N	Spring 1976 Mean	S.D.	N	Spring 1977 Mean	S.D.	N
Social Age	4.8	0.83	277	5.8	0.74	281	6.4	0.75	272
TMR Profile	391.9	172.81	277	466.4	166.57	281	492.7	166.62	278

Variable	1975-76 Gain	N	1976-77 Gain	N	1975-77 Gain	N
Social Age	1.0	261	0.6	252	1.6	260
TMR Profile	74.96	274	24.11	276	98.50	274

TABLE 5

TMR SECONDARY ACHIEVEMENT

Variable	Fall 1975 Mean	Fall 1975 S.D.	Fall 1975 N	Spring 1976 Mean	Spring 1976 S.D.	Spring 1976 N	Spring 1977 Mean	Spring 1977 S.D.	Spring 1977 N
Social Age	7.5	0.65	148	8.4	0.68	153	8.3	0.77	184
TMR Profile	495.7	159.83	179	565.9	155.38	188	579.5	163.78	187

Variable	1975-76 Gain	1975-76 N	1976-77 Gain	1976-77 N	1975-77 Gain	1975-77 N
Social Age	0.9	138	-0.1	137	0.8	139
TMR Profile	72.09	172	12.55	186	88.29	177

3. PH

Tables 6 and 7 summarize the performance of pupils in the PH Category.

Again, all gains are significant beyond the .05 level. Of primary importance, though, is the consistency and stability shown by the results. As with the EMR sample, these children show consistent progress in all the areas assessed and across both years of the study.

TABLE 6

PH ELEMENTARY ACHIEVEMENT

Variable	Fall 1975 Mean	Fall 1975 S.D.	Fall 1975 N	Spring 1976 Mean	Spring 1976 S.D.	Spring 1976 N	Spring 1977 Mean	Spring 1977 S.D.	Spring 1977 N
Social Age	6.8	0.98	147	7.5	0.94	145	8.0	1.00	139
Reading	2.50	1.97	143	2.90	2.13	136	3.56	2.50	141
Spelling	2.25	1.75	132	2.68	1.86	135	3.85	3.16	140
Arithmetic	2.30	1.54	137	2.67	1.43	138	3.22	1.80	142

Variable	1975-76 Gain	1975-76 N	1976-77 Gain	1976-77 N	1975-77 Gain	1975-77 N
Social Age	0.7	135	0.5	132	1.2	134
Reading	0.59	114	0.59	123	1.15	130
Spelling	0.59	116	1.18	121	1.65	126
Arithmetic	0.57	119	0.50	117	1.02	126

TABLE 7

PH SECONDARY ACHIEVEMENT

Variable	Fall 1975 Mean	S.D.	N	Spring 1976 Mean	S.D.	N	Spring 1977 Mean	S.D.	N
Social Age	8.4	1.04	83	9.5	1.05	82	9.9	1.06	82
Reading	5.02	2.71	74	5.33	2.72	73	5.99	3.23	76
Spelling	4.45	2.13	75	4.88	2.34	74	5.32	2.46	76
Arithmetic	4.12	2.02	74	4.56	2.04	74	5.10	2.43	76

Variable	1975-76 Gain	N	1976-77 Gain	N	1975-77 Gain	N
Social Age	1.1	79	0.4	72	1.5	78
Reading	0.36	67	0.60	66	0.93	71
Spelling	0.54	60	0.48	62	0.94	67
Arithmetic	0.60	61	0.61	56	1.12	64

4. SED

Tables 8 and 9 show the progress by the SED sample.

All but two (Table 9) of the gains shown here are statistically significant beyond the .05 level. Again, the tables show that progress is being made in the areas assessed.

TABLE 8

SED ELEMENTARY ACHIEVEMENT

Variable	Fall 1975 Mean	S.D.	N	Spring 1976 Mean	S.D.	N	Spring 1977 Mean	S.D.	N
Social Age	9.2	0.47	121	10.0	0.44	120	11.5	0.53	112
Reading	3.23	1.85	121	3.85	1.97	120	4.73	2.28	106
Spelling	2.85	1.76	121	3.53	1.92	119	4.00	1.95	106
Arithmetic	3.01	1.21	121	3.73	1.24	118	3.98	1.30	106

Variable	1975-76 Gain	N	1976-77 Gain	N	1975-77 Gain	N
Social Age	0.8	112	1.5	107	2.3	110
Reading	0.64	116	0.87	102	1.53	104
Spelling	0.73	111	0.47	98	1.16	102
Arithmetic	0.77	111	0.21	94	0.97	102

TABLE 9

SED SECONDARY ACHIEVEMENT

Variable	Fall 1975 Mean	S.D.	N	Spring 1976 Mean	S.D.	N	Spring 1977 Mean	S.D.	N
Social Age	14.1	0.35	78	15.8	0.38	78	16.8	0.31	72
Reading	6.14	3.15	78	7.10	3.72	77	7.13	3.55	77
Spelling	5.17	2.63	78	5.52	2.67	77	5.92	2.76	77
Arithmetic	5.00	1.66	78	5.78	2.21	77	5.98	2.36	77

Variable	1975-76 Gain	N	1976-77 Gain	N	1975-77 Gain	N
Social Age	1.7	67	1.0	70	2.7	69
Reading	1.09	67	0.06*	69	1.10	70
Spelling	0.41	63	0.47	69	0.83	69
Arithmetic	0.86	72	0.24*	60	1.16	68

*non-significant gains

5. BI

Tables 10 and 11 summarize the performance of the children in the BI category.

All but one of the gains shown are significant beyond the .05 level. Again, a pattern of consistent and stable progress is indicated.

TABLE 10

BI ELEMENTARY ACHIEVEMENT

Variable	Fall 1975 Mean	S.D.	N	Spring 1976 Mean	S.D.	N	Spring 1977 Mean	S.D.	N
Social Age	9.7	0.47	137	10.9	0.48	127	11.8	0.38	135
Reading	2.78	1.31	137	3.53	1.55	134	3.95	1.50	137
Spelling	2.52	1.15	137	3.17	1.28	134	3.64	1.29	137
Arithmetic	2.98	1.01	137	3.62	1.12	133	3.97	1.14	137

Variable	1975-76 Gain	N	1976-77 Gain	N	1975-77 Gain	N
Social Age	1.2	121	0.9	119	2.1	132
Reading	0.76	128	0.48	125	1.19	135
Spelling	0.69	122	0.52	124	1.13	136
Arithmetic	0.68	123	0.44	113	1.07	127

TABLE 11

BI SECONDARY ACHIEVEMENT

Variable	Fall 1975 Mean	S.D.	N	Spring 1976 Mean	S.D.	N	Spring 1977 Mean	S.D.	N
Social Age	14.4	0.26	107	15.5	0.25	106	16.1	0.30	95
Reading	4.15	1.70	107	4.90	1.84	101	5.10	1.95	89
Spelling	3.56	1.12	107	4.01	1.10	101	4.13	1.32	89
Arithmetic	4.29	1.15	107	4.99	1.46	101	5.41	1.62	89

Variable	1975-76 Gain	N	1976-77 Gain	N	1975-77 Gain	N
Social Age	1.1	91	0.6	89	1.7	87
Reading	0.73	95	0.43	78	1.01	87
Spelling	0.48	84	0.19*	73	0.72	78
Arithmetic	0.75	91	0.42	81	1.21	84

B. Quality of Programs

Tables 12 and 13 are summaries of the results gathered with the Indicators of Quality Instrument during the two years of the study.[1]

The two tables show that the results are generally quite positive. Overall, the ratings are consistently above average in relation to the scoring scheme used where a "3" was to be an "average" or "adequate" rating. In both years of the study the average item scores for the total scale and all subscales, except for the Integration with Regular Classroom subscale, were substantially higher than the "average" midpoint of 3. The overall results for the Integration with Regular Classroom subscale were affected by the relatively lower scores of the children in the TMR and PH categories. Pupils in these two categories characteristically have been more segregated than other special education children.

[1]Appendix A presents the Indicators of Quality Instrument as well as results for the individual items.

TABLE 12

SUMMARY OF SUBSCALE AND TOTAL SCORES FOR INDICATORS OF QUALITY - 1976

Instructional Process (11 Items)

	Elementary				Secondary				Total			
Category	N	Mean	S.D.*	Average Item Score	N	Mean	S.D.	Average Item Score	N	Mean	S.D.	Average Item Score
EMR	76	39.34	8.00	3.58	76	36.62	9.40	3.33	152	37.98	8.81	3.45
TMR	43	39.86	6.36	3.62	31	42.81	8.04	3.89	74	41.10	7.21	3.74
PH	30	42.35	7.54	3.85	17	45.12	6.68	4.10	47	42.45	9.59	3.86
SED	42	40.31	7.79	3.66	36	41.19	8.33	3.74	78	40.72	8.00	3.70
BI	25	44.76	7.31	4.07	13	44.69	6.12	4.06	38	44.74	6.84	4.07
Total	216	40.72	7.64	3.70	173	40.15	9.02	3.65	389	40.47	8.28	3.68

Instructional Setting and Programs (13 Items)

EMR	76	50.90	7.19	3.92	76	42.55	8.01	3.27	152	46.72	8.66	3.59
TMR	43	46.91	6.29	3.61	31	47.84	10.52	3.68	74	47.30	8.27	3.64
PH	30	49.55	7.05	3.81	17	47.94	8.39	3.69	47	47.92	10.31	3.69
SED	42	47.00	8.06	3.62	36	44.00	11.50	3.38	78	45.62	9.84	3.51
BI	25	41.84	10.72	3.22	13	45.62	8.14	3.51	38	43.13	9.96	3.32
Total	216	48.18	8.13	3.55	173	44.53	9.48	3.43	389	46.56	8.93	3.58

Administrative Support (9 Items)

EMR	76	34.03	6.17	3.78	76	32.95	6.23	3.66	152	33.49	6.20	3.72
TMR	43	35.48	5.53	3.94	31	38.10	7.01	4.23	74	36.58	6.28	4.06
PH	30	36.45	5.24	4.05	17	37.04	6.27	4.12	47	35.89	7.69	3.99
SED	42	34.55	5.65	3.84	36	36.28	4.11	4.03	78	35.35	5.04	3.93
BI	25	36.28	6.19	4.03	13	34.23	3.88	3.80	38	35.58	5.54	3.95
Total	216	35.08	5.87	3.68	173	35.09	6.16	3.68	389	35.08	5.99	3.68

Integration with Regular Classroom (5 Items)

EMR	76	17.47	4.78	3.49	76	17.49	6.15	3.49	152	17.48	5.49	3.49
TMR	43	9.37	4.72	1.87	31	10.39	5.00	2.07	74	9.80	4.83	1.96
PH	30	11.00	6.46	2.20	17	9.82	4.42	1.96	47	10.34	5.91	2.06
SED	42	17.19	4.97	3.43	36	13.08	6.23	2.61	78	15.30	5.92	3.06
BI	25	17.36	8.17	3.47	13	19.39	5.32	3.87	38	18.05	7.31	3.61
Total	216	14.82	6.55	2.96	173	14.63	6.65	2.93	389	14.74	6.58	2.95

Total Score (38 Items)

EMR	76	141.74	21.34	3.73	76	129.61	17.95	3.41	152	135.67	20.57	3.57
TMR	43	131.63	12.70	3.46	31	139.13	24.19	3.66	74	134.77	18.63	3.54
PH	30	139.35	17.48	3.66	17	139.94	17.63	3.68	47	136.60	26.62	3.59
SED	42	139.05	17.51	3.65	36	134.56	18.37	3.54	78	136.97	17.94	3.60
BI	25	140.24	24.41	3.69	13	143.92	14.78	3.78	38	141.50	21.46	3.72
Total	216	138.80	19.20	3.65	173	134.40	19.43	3.54	389	136.84	19.40	3.60

*S.D. = Standard Deviation

TABLE 13

SUMMARY OF SUBSCALE AND TOTAL SCORES FOR INDICATORS OF QUALITY - 1977

Category	Elementary N	Elementary Mean	Elementary S.D.	Elementary Average Item Score	Secondary N	Secondary Mean	Secondary S.D.	Secondary Average Item Score	Total N	Total Mean	Total S.D.	Total Average Item Score
Instructional Process (11 Items)												
EMR	64	41.94	6.58	3.81	71	39.87	7.42	3.62	135	40.85	7.08	3.71
TMR	41	43.29	7.59	3.93	28	43.86	8.15	3.98	69	43.52	7.77	3.95
PH	25	46.84	5.12	4.25	13	43.85	6.97	3.98	38	45.82	5.90	4.16
SED	22	48.09	5.40	4.37	11	41.73	8.08	3.79	33	45.97	6.98	4.17
BI	13	46.62	6.04	4.23	12	50.58	3.40	4.59	25	48.52	5.25	4.41
Total	165	44.21	6.83	4.01	135	42.19	7.89	3.83	300	43.30	7.39	3.93
Instructional Setting and Programs (13 Items)												
EMR	64	48.67	6.63	3.74	71	44.20	7.28	3.40	135	46.32	7.31	3.56
TMR	41	50.39	7.83	3.87	28	51.50	7.10	3.96	69	50.84	7.50	3.91
PH	25	55.84	8.08	4.29	13	47.69	8.15	3.66	38	53.05	8.90	4.08
SED	22	53.23	5.56	4.09	11	46.36	6.95	3.56	33	50.94	6.80	3.91
BI	13	51.46	6.21	3.95	12	54.33	8.41	4.17	25	52.84	7.34	4.06
Total	165	51.01	7.39	3.92	135	47.13	8.15	3.62	300	49.26	7.97	3.78
Administrative Support (9 Items)												
EMR	64	36.50	3.94	4.05	71	35.28	5.60	3.92	135	35.86	4.90	3.98
TMR	41	37.05	4.07	4.11	28	36.32	4.21	4.03	69	36.75	4.11	4.08
PH	25	39.52	3.53	4.39	13	37.85	3.46	4.20	38	38.95	3.55	4.32
SED	22	38.68	3.33	4.29	11	38.18	4.75	4.24	33	38.52	3.79	4.28
BI	13	38.69	4.05	4.29	12	41.00	2.80	4.55	25	39.80	3.63	4.42
Total	165	37.56	3.98	4.17	135	36.49	5.13	4.05	300	37.08	4.56	4.12
Integration with Regular Classroom (5 Items)												
EMR	64	19.20	4.52	3.84	71	18.63	6.60	3.72	135	18.90	5.69	3.78
TMR	41	10.85	5.63	2.17	28	8.79	4.84	1.75	69	10.01	5.39	2.00
PH	25	12.76	7.08	2.55	13	9.69	5.91	1.93	38	11.71	6.78	2.34
SED	22	21.46	4.64	4.29	11	17.36	7.69	3.47	33	20.09	6.03	4.01
BI	13	22.31	5.47	4.46	12	23.33	1.61	4.66	25	22.80	4.05	4.56
Total	165	16.70	6.84	3.34	135	16.04	7.66	3.20	300	16.40	7.21	3.28
Total Score (38 Items)												
EMR	64	146.31	15.16	3.85	71	137.99	19.25	3.63	135	141.93	17.86	3.73
TMR	41	141.59	19.35	3.72	28	140.46	18.77	3.69	69	141.13	18.98	3.71
PH	25	154.96	16.86	4.07	13	139.08	16.69	3.66	38	149.53	18.25	3.93
SED	22	161.46	15.22	4.24	11	143.64	23.11	3.78	33	155.52	19.79	4.09
BI	13	159.08	18.90	4.18	12	169.25	13.44	4.45	25	163.96	16.98	4.31
Total	165	149.47	18.10	3.93	135	141.84	20.51	3.73	300	146.04	19.56	3.84

C. Costs

Table 14 below and the pie charts on the following four pages show how the total money spent by the intermediate units for the five categories in the study was allocated among six major cost areas. Also, the mean, median and range of total class costs are listed.[2]

The table and charts reveal several basic patterns. First, there does not appear to be any substantial difference between the elementary and secondary levels in terms of how the money is allocated among the six cost areas. The portion of the total class cost spent for the six cost areas shown in the pie charts is about the same in elementary and secondary.

A second pattern shown by the pie charts is the similarity, in terms of allocation of portions of money to the six cost areas, among the categories of exceptionality in the study. Only the EMR category differs, mainly because it is the only one of the five which does not receive reimbursement for teachers' aides. Therefore, the percentage of the total money spent for Other Instruction is smaller for this category than for the other four.

Another pattern illustrated by the pie charts is the wide range of average class costs within each category of exceptionality. In almost all the distributions the highest average class cost is more than twice as much as the lowest in the distribution. The most extreme example of this is the PH elementary, where the lowest average class cost is $17,996 and the highest is $60,343.

TABLE 14

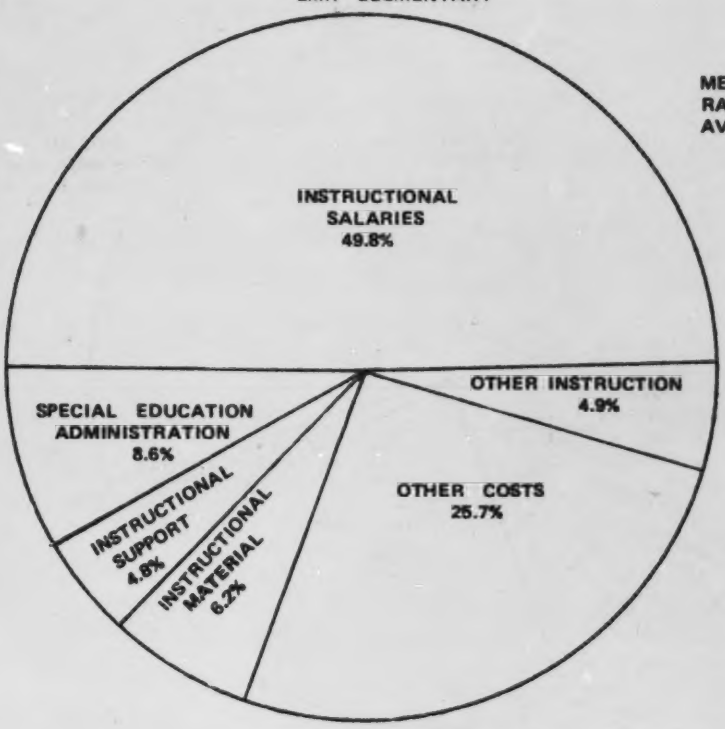
PERCENTAGE ALLOCATION OF COSTS BY CATEGORIES OF EXCEPTIONALITY
(Elementary and Secondary)

		Instr. Sal.	Other Instr.	Instr. Mat.	Instr. Support	Sp. Ed. Admin.	Other Costs	Avg. Class Costs
EMR	(E)	49.8	4.9	6.2	4.8	8.6	25.7	$23,355
	(S)	54.7	2.4	6.1	4.9	8.4	23.4	25,865
TMR	(E)	40.7	20.0	4.8	4.1	7.3	20.0	34,614
	(S)	41.2	18.0	5.2	4.3	7.5	23.8	32,614
PH	(E)	39.1	16.9	4.9	7.3	7.5	24.3	36,382
	(S)	40.9	17.8	4.3	6.7	7.0	23.3	42,770
SED	(E)	41.9	17.2	4.7	6.5	7.0	22.7	28,286
	(S)	44.1	14.2	5.1	4.6	7.2	24.8	29,501
BI	(E)	45.4	15.2	5.3	4.7	7.5	21.9	25.972
	(S)	44.6	15.7	6.5	4.6	7.2	21.4	25,869

[2]The complete distributions of ADM costs and average class costs for the two years of the study are presented in Appendix C.

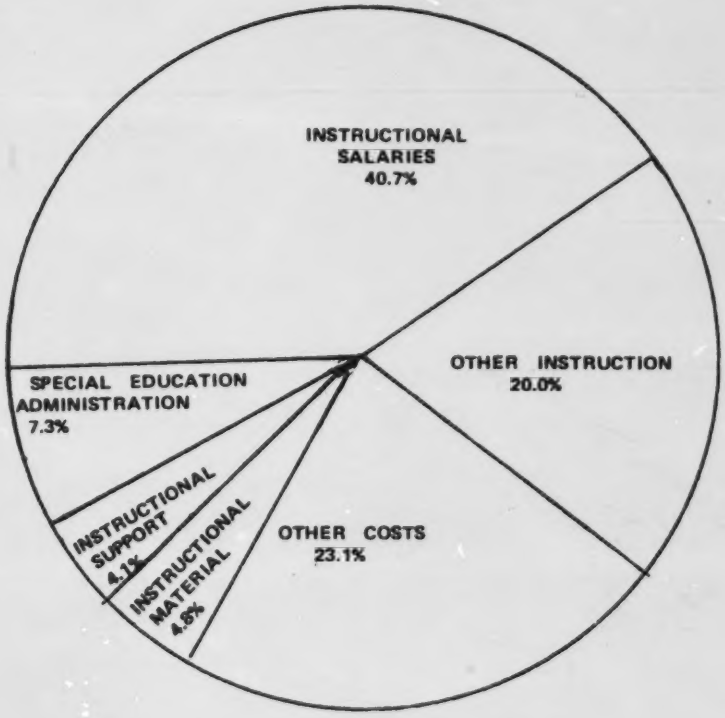
IU SPECIAL EDUCATION AVERAGE CLASS COSTS - 1975-76

EMR ELEMENTARY



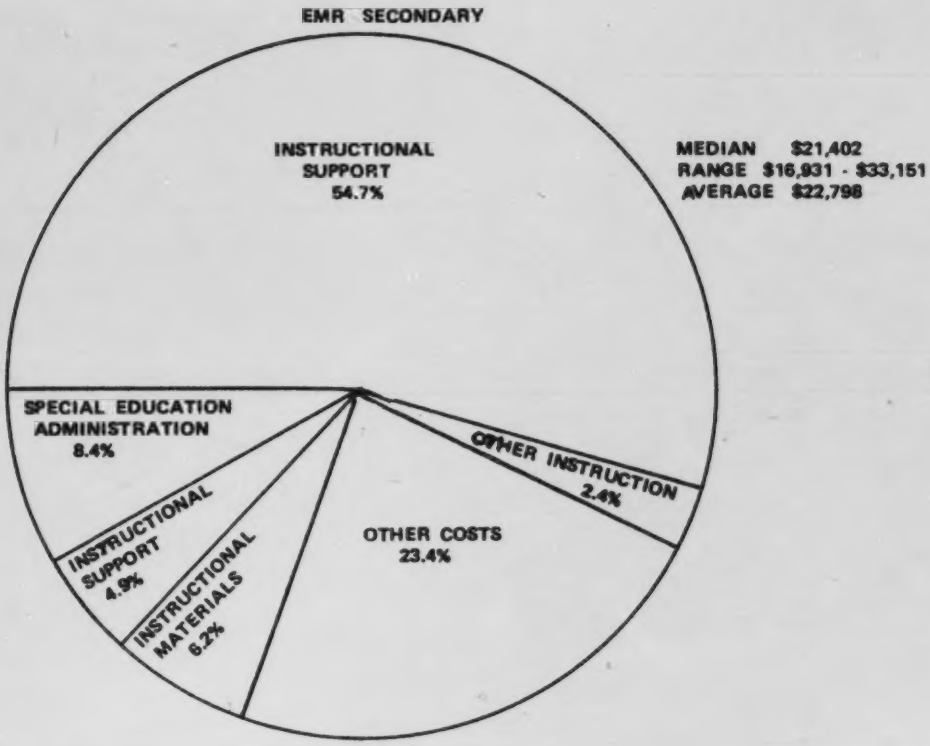
MEDIAN $23,355
RANGE $17,689 - $34,799
AVERAGE $22,730

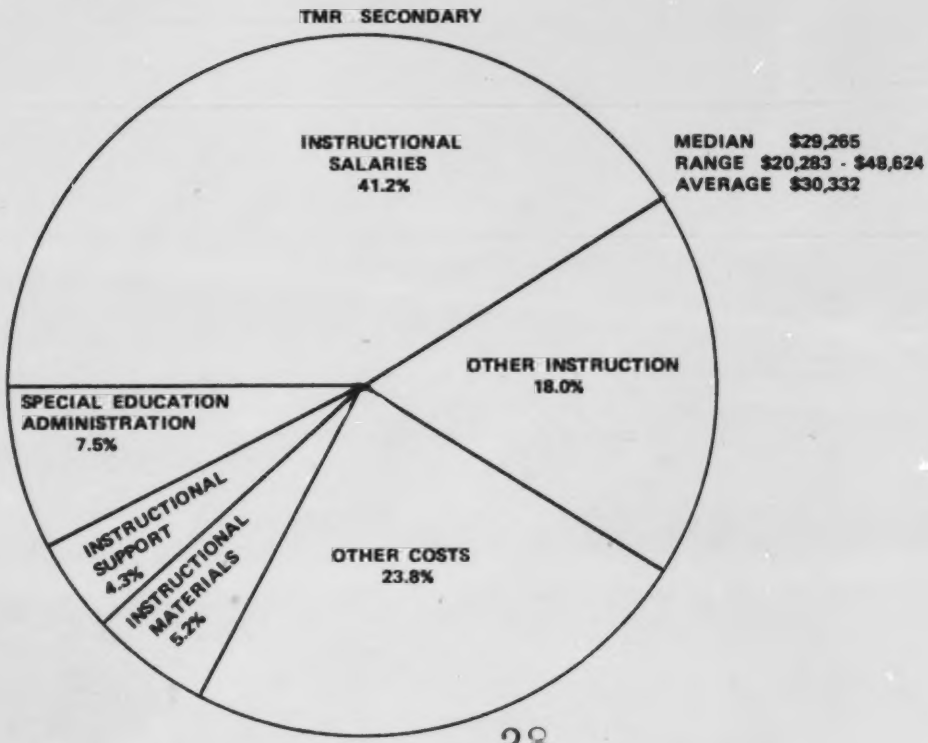
TMR ELEMENTARY



MEDIAN $34,614
RANGE $21,140 - $45,230
AVERAGE $30,099

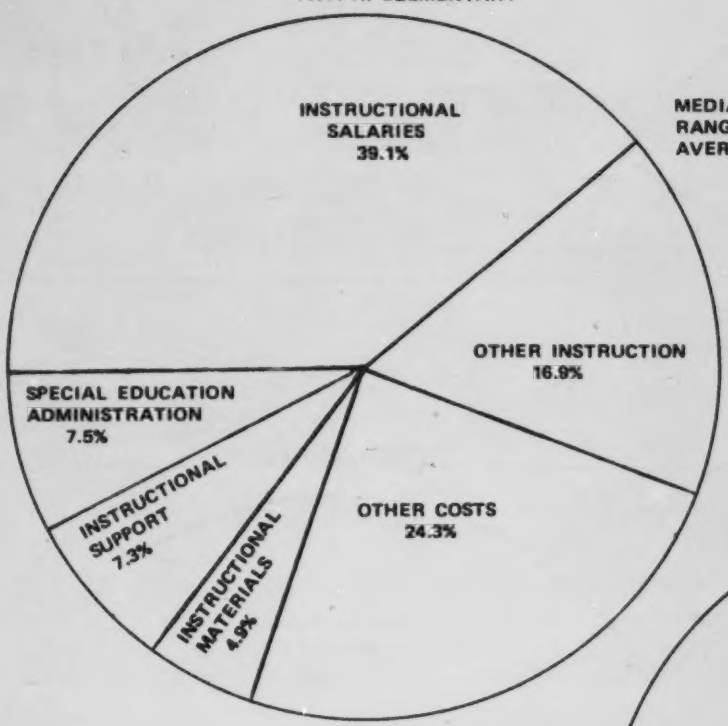
IU SPECIAL EDUCATION AVERAGE CLASS COSTS - 1975-76





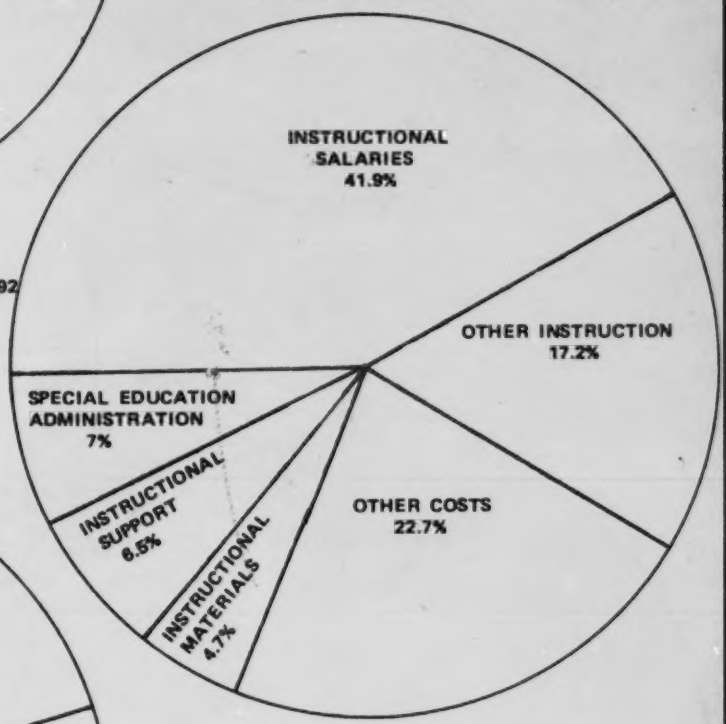
IU SPECIAL EDUCATION AVERAGE CLASS COSTS - 1975-76

PHY. H. ELEMENTARY



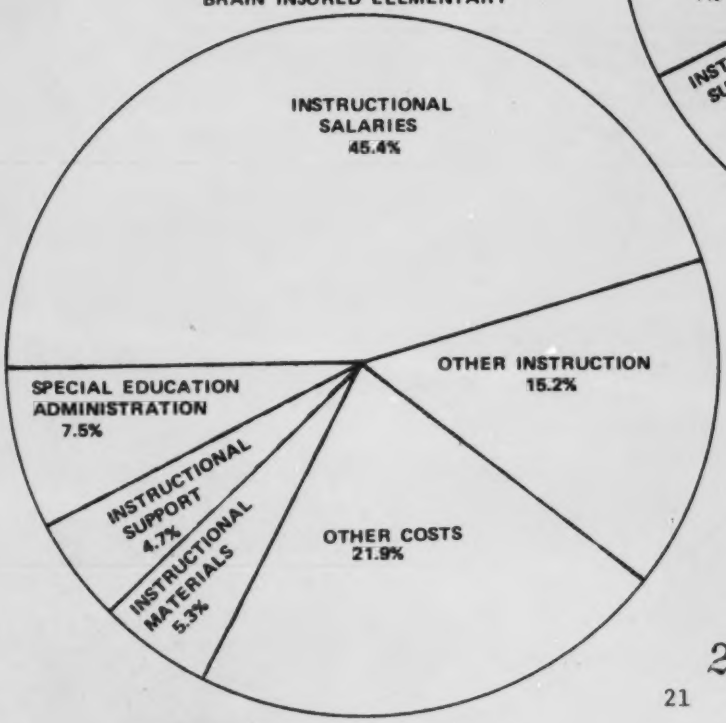
MEDIAN $36,382
RANGE $17,996 - $60,343
AVERAGE $32,000

SED ELEMENTARY



MEDIAN $28,286
RANGE $20,937 - $39,992
AVERAGE $27,949

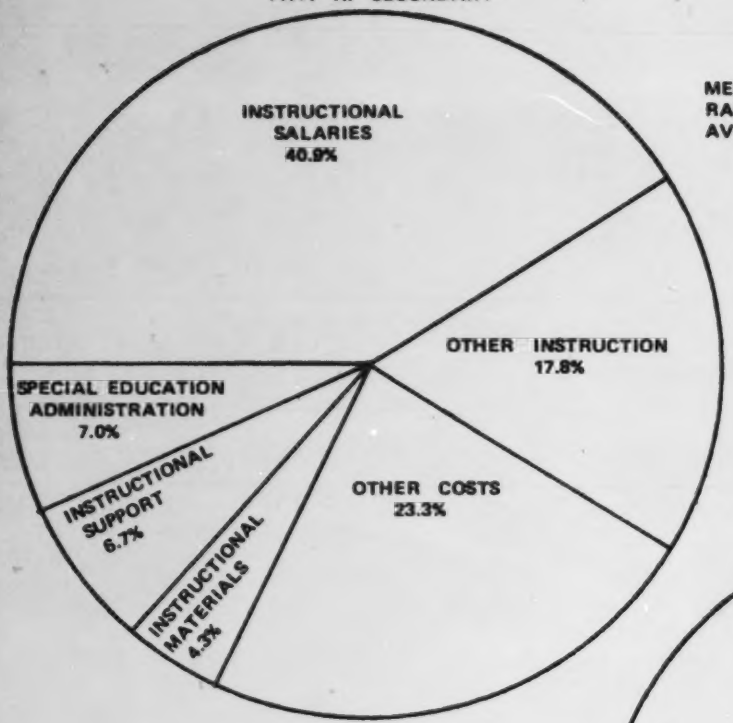
BRAIN INJURED ELEMENTARY



MEDIAN $25,399
RANGE $17,763 - $32,285
AVERAGE $25,519

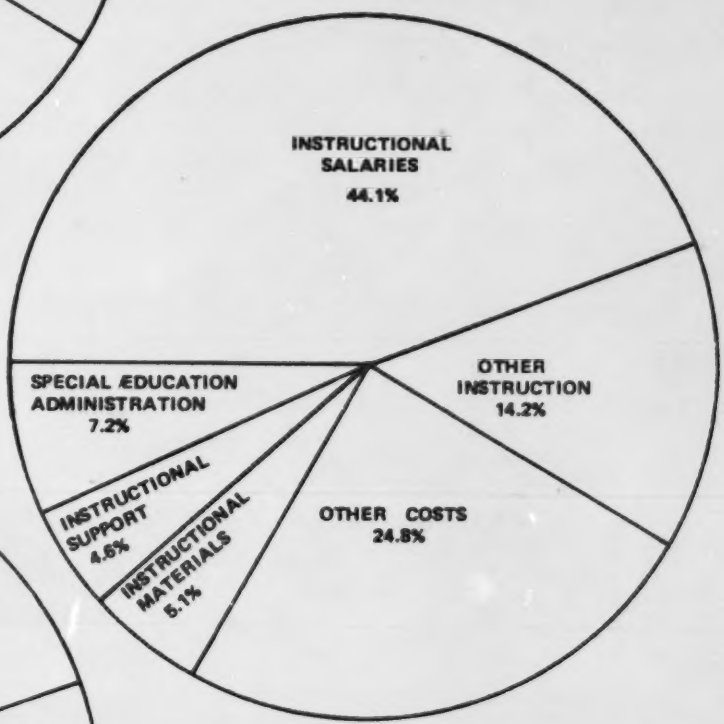
IU SPECIAL EDUCATION AVERAGE CLASS COSTS - 1975-76

PHY. H. SECONDARY



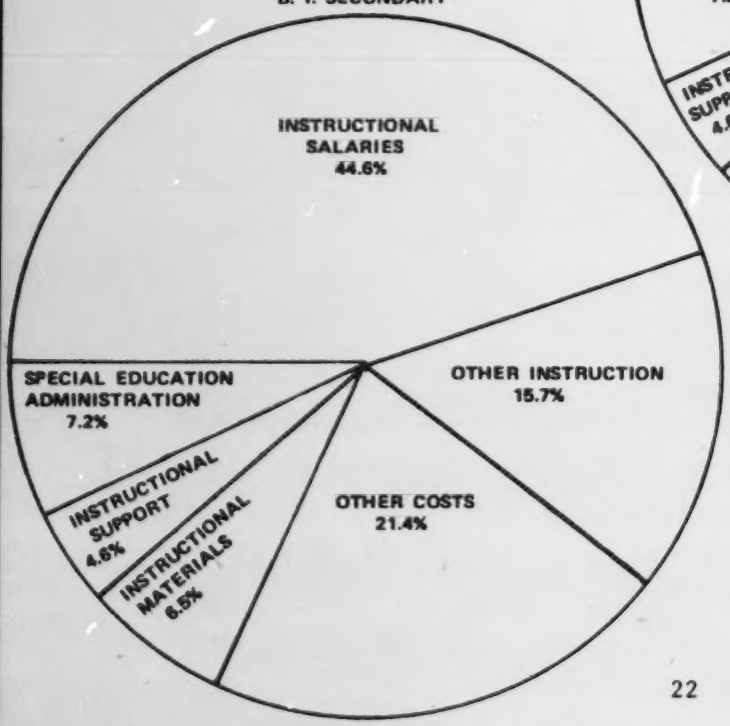
MEDIAN $33,039
RANGE $25,284 - $57,535
AVERAGE $33,963

SED SECONDARY



MEDIAN $27,078
RANGE $14,315 - $40,253
AVERAGE $26,581

B. I. SECONDARY



MEDIAN $23,821
RANGE $14,852 - $36,017
AVERAGE $24,506

A gross, overall comparison of the per-pupil costs of special education and regular education is shown by data in Table 15. By deducting the cost of transportation, capital outlay and debt service from the overall cost of regular education, it is possible to compute ADM cost estimates for regular education that are essentially equivalent, in terms of costs involved and method of calculation, to those prepared for special education. These ADM costs then were used to calculate the indices in Table 15 which express the ratio of regular education cost per ADM to special education cost per ADM.

In 1974-75, the statewide regular education ADM costs[3] used to calculate the indices were $951 for elementary, $1,273 for secondary and $1,191 for a combined elementary-secondary total. In 1975-76 these overall ADM costs[4] were $1,057 for elementary, $1,389 for secondary and $1,314 for the combined total.

TABLE 15

SPECIAL EDUCATION COST INDICES

	EMR		TMR		PH	
	1974-75[5]	1975-76	1974-75	1975-76	1974-75	1975-76
Elementary	2.38	2.10	3.43	3.39	3.64	4.17
Secondary	1.66	1.64	2.00	2.21	3.25	3.18
Total	1.83	1.71	2.50	2.56	3.08	3.36

	SED		BI	
	1974-75	1975-76	1974-75	1975-76
Elementary	4.45	4.76	3.53	3.62
Secondary	2.87	3.31	1.82	2.58
Total	3.41	3.71	2.67	2.88

As Table 15 shows, the EMR category is the only one of the five examined with a total index under 2.00. Indeed, each special education pupil in the other four categories costs on the average at least 2 1/2 times as much to educate as a regular education pupil. The two most costly categories were PH and SED, where more than three times as much per child was spent.

In every case, elementary costs are higher than equivalent secondary costs. In most (10 of 15) of the comparisons from the first to the second year of the study, the index was higher during the second year. In those five cases where the first year index is higher than the second year index, three are in the EMR category.

[3]Source: Bureau of Information Systems, Division of Educational Statistics, Calculator, Vol. 17, No. 8.

[4]Source: Ibid. Calculator, Vol. 18, No. 8.

[5]Source: Bureau of Information Systems, Division of Research, DEAS 1340; DEAS 2236-OT (10-76).

D. Relationship of Cost and Quality of Instruction to Student Gains

Most of the social and achievement gains of special education students are statistically significant. It now becomes equally important to determine the reasons for these significant gains. Three factors of particular importance to educators are (1) the cost of special education instruction, (2) the quality of special education instruction, and (3) the initial abilities of special education students upon entering a special education program. Because all three factors influence special education programs simultaneously, it is important to study them in combination as well as individually. The basic research question is: What amount of the significant social and achievement gains is explained, or can be predicted, by the cost of the program, by the quality of the instruction and by the initial ability of the student entering the special education program?

A method which explains student gains in terms of each factor and the combinations of these factors is commonality analysis. Specifically, commonality analysis was used to determine what per cent of the observed student gains is uniquely attributed to cost of instruction, to quality of instruction and to student pretest and what per cent of the observed gains is explained by these three factors working together. Two year achievement gains measured by the reading, mathematics and spelling subtests of the Wide Range Achievement Tests were examined for the EMR, PH, SED and BI groups. Performance gains for the TMR group were measured by the TMR Performance Profile. Social gains, measured by the Vineland Social Maturity Scale, were examined for all five exceptionality groups.

The commonality analysis revealed that gain scores of the five exceptionality groups were affected differently by instructional cost, quality of instruction and student pretest scores.[6] Table 16 shows the percentages of social and achievement gain scores explained by the combined factors.

The combined effects of instructional cost, instructional quality and student pretest score explained 21 per cent of the social gains, six per cent of the reading gains, 21 per cent of the arithmetic gains and 26 per cent of the spelling gains for the EMR group. The combined factors significantly affected EMR social gains, arithmetic gains and spelling gains.

TMR social and performance gains were significantly related to the combination of the three factors being studied. Some 49 per cent of the TMR social gains and 32 per cent of the TMR performance gains were explained by the combined effects of cost and quality of instruction and pretest.

Substantial, though not statistically significant, percentages of the PH arithmetic and spelling gains were related to this factor combination. For the SED group, reading gains related most to cost and quality of instruction and prior background as measured by the pretest score.

A particularly high percentage of BI social gains and arithmetic gains were accounted for by cost of instruction, quality of instruction and pretest score. Arithmetic gains were significantly related to these combined factors.

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[6]For a more extensive and detailed discussion of each separate analysis, see Appendix E.

TABLE 16

PERCENTAGES OF GAIN SCORES EXPLAINED BY COMBINED FACTORS

	TESTS				
	Vineland Social Maturity	WRAT Reading	WRAT Arithmetic	WRAT Spelling	TMR Performance Profile
EMR (N = 132)	21*	6	21*	26*	
TMR (N = 54)	49*				32*
PH (N = 32)	15	11	26	34	
SED (N = 28)	14	27	3	15	
BI (N = 20)	49	26	70*	30	

*Significant at the $\alpha = .01$ level

The unique contributions of cost of instruction, quality of instruction and student pretest score to the social and achievement gains of exceptional students also are provided by commonality analysis. For the EMRs, social gains were significantly dependent ($p < .05$)[7] upon cost of instruction, quality of instruction and pretest score. About eight per cent of the EMR social gains were attributable to pretest scores, with an additional nine per cent attributable to quality of instruction and three per cent to cost of instruction. Achievement gains in arithmetic and spelling for the EMR group were most dependent, and significantly so, upon pretest scores. About 18 per cent of the arithmetic gains and almost 17 per cent of the spelling gains of the EMR group were explained by their pretest scores. Spelling gains also were significantly dependent upon quality of instruction.

The most influential factor in the TMR's social and performance gains was the student pretest score. In other words, the performance level of the TMR student upon entering a special education program had a greater influence on social and performance gains than did cost of quality of instruction. However, quality of instruction was a significant determinant of social and performance gains; 13 per cent of social gains and 14 per cent of performance gains were explained uniquely by quality of instruction. Cost of instruction explained only four per cent of social gains for the TMR group, but this relationship also was statistically significant. In general, cost of instruction, quality of instruction and student pretest score were highly related and predictive of TMR student progress.

Quality of instruction was the best predictor of social and achievement gains for the PH classrooms. Some 12 per cent of the PH social gains, five per cent of the reading gains, 24 per cent of the arithmetic gains and a significant 32 per cent of the spelling gains were explained uniquely by the quality of instruction. Pretest scores and classroom costs had little direct, explainable effect on achievement and social gains in the PH classrooms.

[7] $p < .05$ means these findings would not be due to chance more than five times out of 100. This level of significance holds for all following statements reporting statistical significance.

The SED classrooms exhibited characteristics very different from other exceptionality groups, since no significant relationships were found between gains and inputs such as cost and quality of instruction. Quality and cost of instruction did have a limited effect on reading gains in the SED classroom; about 14 per cent of the reading gains were explained by quality of instruction and seven per cent were explained by cost of instruction.

Quality of instruction was the single largest influence on social and achievement gains in the BI classrooms. Some 33 per cent of social gains, 20 per cent of reading gains, 22 per cent of arithmetic gains and 28 per cent of spelling gains in the BI classrooms were uniquely explained by quality of instruction. Pretest scores were highly related to social gains (16 per cent) and arithmetic gains (18 per cent, which was statistically significant). Cost of instruction was significantly related to arithmetic gains (explaining 13 per cent of the observed gains). Cost of instruction also explained about 12 per cent of the reading gains and seven per cent of the social gains in the BI classroom. Overall, quality and cost of instruction showed a moderate influence on BI classroom gains.

In conclusion, the commonality analysis has shown that gains for each of the exceptionality groups were influenced differently by the factors examined. The EMR, TMR and BI exceptionality group gains were more influenced by student pretest scores, quality of instruction and cost of instruction than were the PH and SED groups. Table 17 shows which factors were most influential upon the gains observed for each exceptionality group.

TABLE 17

RANK ORDER OF FACTOR CONTRIBUTIONS
TO GAIN SCORE VARIANCES

	GAIN SCORE				
Exceptionality	Vineland	Reading	Spelling	Arithmetic	TMR Profile
EMR	2,1,3	2,3,1	1,2,3	1,2,3	
TMR	1,2,3				1,2,3
PH	2,3,1	2,3,1	2,1,3	2,3,1	
SED	1,2,3	2,3,1	2,1,3	2,1,3	
BI	2,1,3	2,3,1	2,3,1	2,1,3	

1 = Pretest 2 = Quality Indicators 3 = Cost

As shown in Table 17, cost was never the best predictor of gain score variance. The most consistent pattern of factor influence resulted for the WRAT reading gains. In 13 of the above 18 combinations, quality of instruction had the greatest influence (of the three factors examined) on gain score variance. In the remaining cases, student pretest scores had the greatest influence on gain score variance. Cost of instruction had little direct influence on social and achievement gain scores.

IV. CONCLUSIONS AND SUMMARY

The results presented in Chapter III suggest several basic conclusions, which will be addressed according to the questions asked in the study.

Question 1: Are children in Pennsylvania's special education programs making significant progress in the areas of basic cognitive skills and social competence?

The data gathered in the two-year study indicate that the children in the sample did make significant progress in the areas assessed. Although there were some discrepancies, consistent patterns of student progress were observed during both years of the study.

Question 2: What is the level of quality, on dimensions such as instructional setting and process, of special education in Pennsylvania?

The results of two years of observations in several hundred special education classrooms in Pennsylvania indicate that the level of quality of these classrooms can be generally characterized as "good," particularly on the dimensions of instructional process, instructional setting and administrative support.

Question 3: What are the relative costs for the five major categories of exceptionality in special education programs in Pennsylvania?

The ADM costs for the students in the five categories of exceptionality involved in this study ranged from about two to three and one-half times as much as the ADM costs for equivalent regular education students. Within each category of exceptionality there was often a fairly wide range of ADM costs across the IUs.

Question 4: Are there significant relationships among the cost, quality and effectiveness measures on Pennsylvania's special education classrooms?

Statistical significance, in terms of explaining student achievement with the cost and quality variables, was obtained in six of 18 separate commonality analyses. Perhaps of more practical significance is that in 13 of the 18 analyses the Indicators of Quality measure was the primary contributor in accounting for unique variance. In none was cost the primary contributor. Probably the most useful conclusion to be drawn here is that the complexity of the relationships being studied calls for variables more precise than those available in this study.

The results of the commonality analyses also indicate significant, unique contributions by pretest scores to gain scores three out of four times for EMRs, two of two times for TMRs and one of four for BIs. Significant, unique contributions by quality of instruction to gain scores occurred two of four times for EMRs, two of two times for TMRs and one of four times for PHs. Cost of instruction made a significant unique contribution to gain scores one of four times for EMRs and BIs and one of two times for TMRs. Overall, significant, unique contributions to gain scores were made by pretests six of 18 times, by quality of instruction five of 18 times and by cost of instruction three of 18 times.

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APPENDIX A

Division of Research
Bureau of Information Systems
Pennsylvania Department of Education
Box 911
Harrisburg, Pennsylvania 17126

INDICATORS OF QUALITY

A. Instructional Process and Related Components

Definition: These involve the skillful use and thoughtful preparation of teaching techniques that promote motivation and participation, that gain the attention of the students, that meet the needs of the individual student. This includes the systematic use of individualized instructional techniques. There are comprehensive and specific instructional objectives suited to each level of mastery.

1. The teacher has comprehensive and specific objectives for all pupils.

1 (7 - 0)[1]	2 (18 - 9)	3 (27 - 34)	4 (22 - 32)	5 (27 - 25)
Some evidence of good objectives		Objectives quite comprehensive and specific		To an outstanding degree

2. The teacher skillfully gains and maintains the attention of students.

1 (1 - 0)	2 (6 - 3)	3 (22 - 19)	4 (35 - 42)	5 (35 - 36)
Most students inattentive		Attention obtained from many students		Attention obtained from all students

3. The teacher encourages each student to participate in learning activities.

1 (2 - 0)	2 (12 - 1)	3 (23 - 16)	4 (32 - 44)	5 (32 - 38)
Achieved participation by few		Achieved some participation by many		Achieved maximum participation

4. The work assigned is based upon needs, interests and ability of each child.

1 (2 - 0)	2 (5 - 5)	3 (45 - 23)	4 (27 - 37)	5 (21 - 36)
Little evidence of adapting work to students		Work is adapted to students' needs, interests and abilities		Work is adapted to each student's interest and abilities

5. The teacher adjusts the techniques used to the needs of each student.

1 (2 - 0)	2 (6 - 5)	3 (32 - 28)	4 (35 - 34)	5 (26 - 33)
Little adjustment, if any		Some adjustment of techniques		Techniques adjusted for each student

6. The teacher checks individual student progress frequently.

1 (2 - 0)	2 (5 - 5)	3 (26 - 21)	4 (45 - 38)	5 (24 - 35)
Little checking of student progress		Checked student progress once or twice of at least half the class		Frequently checked progress of each student

7. The teacher encourages and effectively handles student questions.

1 (2 - 5)	2 (7 - 11)	3 (36 - 31)	4 (32 - 34)	5 (23 - 19)
Little encouragement and poor handling of questions		Moderate encouragement of and effective handling of questions		Skillfully encourages and very effectively handles questions

8. The teacher uses training aids effectively.

1 (4 - 1)	2 (7 - 8)	3 (37 - 31)	4 (30 - 35)	5 (24 - 26)
Training aids not very effectively used		Training aids used reasonably well		Training aids most effectively used to expedite learning

9. Programs for all special education students provided for individual differences.

1 (2 - 0)	2 (7 - 3)	3 (31 - 18)	4 (33 - 42)	5 (27 - 37)
Makes provision for less than half of the pupils		Makes provision for at least half of the pupils		Teacher knows and suggests next step for each student as he or she needs it

10. The teacher used individual diagnosis and prescription techniques.

1 (5 - 0)	2 (11 - 5)	3 (30 - 30)	4 (36 - 30)	5 (19 - 35)
Work adapted to few students' ability and experience		Work adapted to many students' ability and experience		Work well adapted to each student's ability and experience

[1] The two numbers in parentheses after each response choice represent the per cent of classes assigned that rating for the two years of the study. For example, seven percent of the classes observed were given a rating of "1" on this item during the first year of the study; zero percent were given a rating of "1" when observed the second year.

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11. The time scheduling of special education students reflects an awareness of individual capabilities and tolerances.

1 (3 - 0)	2 (15 - 3)	3 (34 - 26)	4 (30 - 43)	5 (18 - 27)
Some evidence		Done reasonably well		Optimum time scheduling reflecting sensitivity to individual capabilities and tolerances

B. Instructional Setting

Definition: The classroom is physically flexible, permitting diversity of activities related directly to the instructional plans of the teacher, i.e., one that does not place constraints upon the implementation of any instructional strategy. Furnishings are appropriate to the characteristics of the children to be served and designed to facilitate the instructional process. The classroom is within a regular school setting or within ready access to a regular school setting. Adequate and appropriate space and facilities are provided for itinerant services.

12. The special education classroom is flexible enough to allow a diversity of activities.

1 (4 - 2)	2 (18 - 17)	3 (29 - 22)	4 (24 - 31)	5 (25 - 27)
Rigid, structured seating, no carrels, no possibility of setting up special areas		Some evidence of possibility of alternative settings		Considerable flexibility is evident

13. Space in the classroom is adequate for the children enrolled.

1 (9 - 5)	2 (13 - 11)	3 (39 - 24)	4 (21 - 28)	5 (18 - 33)
Constrained space		Adequate space		Optimum space

14. Furniture in the classroom is adequate for the children enrolled.

1 (4 - 2)	2 (25 - 16)	3 (37 - 31)	4 (19 - 22)	5 (19 - 29)
Ill-fitted, difficult to use, insufficient		Suitable, easy to use		Very suitable, easy to use

15. Equipment in the classroom is adequate for the children enrolled.

1 (2 - 1)	2 (16 - 11)	3 (33 - 31)	4 (27 - 28)	5 (22 - 29)
Inappropriate or insufficient		Adequate		Appropriate and sufficient

16. The special education room includes alternative learning centers.

1 (7 - 8)	2 (28 - 22)	3 (38 - 25)	4 (18 - 22)	5 (19 - 23)
Not evident		Evident to a satisfactory degree		Very effectively included

17. Adequate classroom space and appropriate facilities are provided for itinerant services.

1 (12 - 2)	2 (17 - 12)	3 (45 - 39)	4 (10 - 26)	5 (16 - 21)
Space not appropriate		Space is appropriate		Space designed and built for these purposes

C. Program and Services

Definition: Special services are available to the student or his parents, including the services of a certified school psychologist, a physical therapist, a vocational guidance counselor, a speech and hearing clinician, etc. These services are provided at every level of education. The programs and services provided are capable of meeting the needs of the total range of exceptional children, including the multiply handicapped and include a parent education program.

18. There is a continuum of programs and services through all school ages.

1 (3 - 0)	2 (1 - 1)	3 (18 - 7)	4 (18 - 19)	5 (61 - 73)
None available		Available for some		Available for all

19. The program has provisions for the total range and incidence of exceptionality including multiply handicapped.

1 (0 - 2)	2 (8 - 1)	3 (18 - 8)	4 (12 - 22)	5 (61 - 68)
No provisions		Provisions for some		Provisions for all

20. A parent education program is an integral part of the special education program.

1 (14 - 4)	2 (17 - 20)	3 (38 - 39)	4 (23 - 23)	5 (9 - 13)
No planned effort or planned program		Adequate effort made		Excellent program

21. A speech program is provided to serve speech impaired children of all exceptionalities from kindergarten through 12th grade.

1 (6 - 0)	2 (0 - 3)	3 (10 - 10)	4 (6 - 25)	5 (77 - 62)
Not available		Available for some		Available for all

22. Itinerant vision and hearing teachers work with kindergarten children.

1 (13 - 4)	2 (1 - 7)	3 (9 - 13)	4 (6 - 19)	5 (72 - 58)
No kindergarten children		Some kindergarten children		All kindergarten children

23. The services of a physical therapist are available for students who require them.

1 (20 - 4)	2 (8 - 7)	3 (8 - 13)	4 (11 - 19)	5 (54 - 58)
Not available		Available for some		Available for all

24. A public relations effort maintains community awareness of and interest in special education.

1 (18 - 8)	2 (15 - 23)	3 (24 - 32)	4 (29 - 22)	5 (14 - 15)
No planned effort		Adequate effort		Excellent effort with organized program

D. Records and Reporting

Definition: The maintenance of systematic and periodic records facilitates an accurate assessment of each child's educational progress, and his strengths and weaknesses in each specific skill area of concern. Such records are based upon appropriate normative standards and measures. This file should also include records of the results of professional examinations including vision and hearing screenings, neurological screening, and, where indicated, psychiatric evaluations. It should include any follow-up diagnostic findings that follow placement of a child in the special education setting in addition to preplacement evaluation. With proper safeguards, parents or guardians are given access to the file upon request and are informed of this right.

25. Appropriate examination records for each child, including psychological, vision and hearing screening are on file.

1 (1 - 0)	2 (3 - 1)	3 (20 - 9)	4 (18 - 32)	5 (58 - 59)
The records do not exist for every child		Records exist for each child but in some cases not complete up-to-date		Records exist for each child, are complete and up-to-date and are accessible to teacher

26. Continual records (cumulative growth) of the student's attainment and progress are maintained.

1 (1 - 1)	2 (8 - 3)	3 (22 - 15)	4 (16 - 30)	5 (54 - 51)
Not on every child		Progress records on all but irregularly maintained		Progress records on all and regularly maintained

27. An educational assessment of each child indicating strengths and weaknesses in specific skill areas are on file.

1 (10 - 1)	2 (9 - 6)	3 (11 - 10)	4 (20 - 29)	5 (50 - 54)
Education assessment not on file for every child		Educational assessment on file for each child but not always made within last three years		On file for each child and made within last three years

E. Diagnosis and Evaluation

Definition: Diagnosis and evaluation involves early (preschool, where possible) and comprehensive identification of "high risk" children coupled with immediate follow-through of prescription, assignment and appropriate individualized instruction, using, wherever possible, team evaluation by a psychiatrist, a neurologist, etc. The special education teacher is fully capable of performing initial assessment of academic status and recognizing special problems for referral and specialized evaluation. Comprehensive evaluation for possible educational reassignment is conducted at intervals of two years. It is also conducted annually where transfer to a different type of program or service is contemplated, or upon parental request. Parental consent is obtained for transfer.

28. Preschool screening is available.

1 (15 - 2)	2 (4 - 2)	3 (24 - 13)	4 (19 - 32)	5 (38 - 39)
Done for some		Done for many		Done for all

29. There is early and comprehensive identification of "high risk" school age children and immediate follow-through of individual prescription and instruction.

1 (18 - 0)	2 (6 - 2)	3 (24 - 27)	4 (42 - 19)	5 (10 - 84)
Some children are identified early		Most children are identified early and follow-through occurs soon		All problem children are identified early and immediate follow-through occurs

30. The educational assignment of every special education student is reevaluated not less than every two years.

1 (2 - 1)	2 (1 - 0)	3 (4 - 3)	4 (15 - 12)	5 (78 - 84)
Done for some		Done for many		Done for all

F. Supervision and Administration

Definition: The special education supervisor allots adequate time for and encourages staff/parent conferences periodically. The administrative staff attempts to maintain, by appropriate means, community awareness of the program and to stimulate public interest in the special education program. In working with the staff, the administrator or supervisor provides leadership in the introduction of needed and beneficial program changes and is cognizant of legislative and policy criteria relative to the special education program or planned change.

31. The supervisor provides leadership in introducing needed and beneficial program changes.

1 (9 - 2)	2 (14 - 23)	3 (27 - 31)	4 (18 - 29)	5 (32 - 15)
Little leadership		Regular and adequate leadership		Provides excellent leadership

32. The supervisor allots time for and encourages staff/parent conferences.

1 (2 - 2)	2 (16 - 13)	3 (26 - 25)	4 (6 - 34)	5 (30 - 26)
No time allotted		To a limited extent allots time		Allots necessary time and encourages staff/parent conferences

33. The teacher shares information with special education associates and/or other staff.

1 (2 - 1)	2 (10 - 6)	3 (25 - 28)	4 (25 - 38)	5 (39 - 26)
No information is shared with other teachers		Some information is shared		All teachers share information

G. Integration with the Regular Classroom Program

Definition: Special education students are, where feasible, integrated into regular education programs. Children are not placed in a self-contained special education classroom as the preferred placement, but rather they are given necessary supportive services adjunctive to their regular education experiences. Activities in which regular and special education can participate appropriately are sought and routinely encouraged. Nonhandicapped children are, in turn, encouraged by faculty attitudes and curriculum to accept and help the special education child. Adequate and appropriate supportive resource staff and services are available to the children in either the self-contained classroom or in the regular classroom.

34. There is evidence of a systematic plan to integrate special education students into regular educational programs.

1 (27 - 22)	2 (15 - 12)	3 (21 - 15)	4 (14 - 13)	5 (24 - 38)
No evidence		Moderate evidence		Considerable evidence

35. Special education children placed in regular classes are provided help by resource and/or special education teachers.

1 (34 - 26)	2 (12 - 7)	3 (13 - 19)	4 (16 - 19)	5 (25 - 29)
No help		Some assistance given		All necessary assistance given

36. Pupils are given opportunities to participate in social, arts, music and physical education activities with nonhandicapped children.

1 (43 - 35)	2 (6 - 8)	3 (8 - 10)	4 (4 - 6)	5 (39 - 41)
No provision		Part of time		On a regular basis

37. There is evidence that nonhandicapped children are encouraged to accept and help special education children.

1 (36 - 26)	2 (16 - 8)	3 (26 - 19)	4 (15 - 24)	5 (14 - 15)
No evidence		Moderate evidence		Considerable evidence

38. Special education classes are located within regular schools or have ready access to them.

1 (33 - 28)	2 (6 - 3)	3 (2 - 2)	4 (1 - 2)	5 (58 - 65)
Does not have ready access		Has ready access		Located within a regular school

APPENDIX B

Division of Research
Bureau of Information Systems
Pennsylvania Department of Education

INSTRUCTIONS FOR COMPLETING FORM DEAS-2236-OT (10-76) COSTS FOR FIVE CATEGORIES

Special Education Research Study--1976-77

1. Where possible, use the specific cost for each budget line item such as salaries of teachers, aides, etc.

2. When specific categorical costs cannot be determined, use the instructions for the Basic Education Revised Handbook (draft copy) sent by the Division of Special Education, to allocate the cost among the various categories.

3. Keep in mind to prorate costs for the total number of categories in your IU and post the proper amounts under the five categories on Form DEAS-1670.

4. Be careful to report the exact number of pupils enrolled from each teacher's class record for each category.

5. Be careful to report the exact number of ADMs for each category of exceptionality. Use teacher's class records to obtain total days membership belonged and divide by the number of days in the school year (full-time classes).

6. Report ADMs for part-time or itinerant classes by converting the total minutes of instruction per pupil per week to ADMs in accordance with the following child accounting instructions:

   Calculate ADMs for part-time classes by the following formula.

   Average number of pupils taught by itinerant teachers per week times the number of periods per week that instruction is provided for the individual pupil times the number of minutes per pupil in special class divided by 1650 equals the average daily membership.

   Check with the IU attendance person to obtain the proper ADMs.

7. Do not report any speech and hearing costs under the five categories even though students may be receiving speech or hearing training.

8. If elementary and secondary costs are not accounted for separately in your records, report specific costs for teachers, aides, etc., and prorate the remaining costs on a per pupil basis.

9. Use the final financial expenditures and, if possible, the audited figures for this report.

COMMONWEALTH OF PENNSYLVANIA – DEPARTMENT OF EDUCATION

☐ELEMENTARY ☐SECONDARY	SPECIAL EDUCATION COST/QUALITY STUDY COSTS BY SPECIAL EDUCATION CATEGORIES 1975-76 DEAS-2236-QT (10-76)	INTERMEDIATE UNIT NAME	IU # DATE SUBMITTED

Instructions: Submit original to the Department of Education, Bureau of Information Systems, Division of Research, Box 911, Harrisburg, Pa. 17126. Att: Dr. John G. Cober, by December 15, 1976. Report the 1975-76 expenditures by the various categories and the correct ADM's and enrollment figures based on the teacher's records. Prorate elem. and sec. expenditures according to the spec. instructions for Spec. Ed. in the Basic Handbook.

EXPENDITURE ACCOUNT	EDUCABLE	TRAINABLE	SOCIALLY & EMOTIONALLY DISTURBED	PHYSICALLY HANDICAPPED	BRAIN INJURED/ L.D.
0100 ADMINISTRATION					
0151 Contracted Auditing Services					
0154 Contracted Legal Services					
0159 Other Contracted Services					
Total 0100					
0200 INSTRUCTION					
0211 Salaries, Principals					
0212 Salaries, Director, Special Education					
0212.1 Salaries, Supervisors					
0212.2 Salaries, Instructional Advisers					
0213 Salaries, Teachers					
0213.1 Salaries, Teachers, Substitutes					
0216 Salaries, Other (Ex: Other Instructional Staff)					
0218 Salaries, Instructional Assistant					
1219 Salaries, Clerical					
0221 Textbooks					
0224 Audio-Visuals					
0225 Other					
0222-0229 Supplies					
0231 In-Service Training					
0239 Staff Travel					
0239.1 Other Expenses					
0250 Contracted Services					
Total 0200					
0300 PUPIL PERSONNEL SERVICES					
0313 Salaries, School Psychologist Total 0300					
0400 HEALTH SERVICES					
0412 Salaries, Psychiatrist					
0413 Salaries, Nurses					
0415 Salaries, Clinical Psychologist					
0415.1 Salaries, Psychiatric (Social Worker)					
0415.2 Salaries, Therapists					
0419 Salaries, Clerical					
0422 Supplies					
0432 Staff Travel					
0432.1 Other Expenses					
0452 Contracted Medical Services					
Total 0400					

☐ Elem. ☐ Sec. EXPENDITURE ACCOUNT	Educable	Trainable	Socially & Emotionally Disturbed	Physically Handicapped	Brain Injured/ L.D.
0600 OPERATION AND MAINTENANCE OF PLANT					
0612 Operation & Maintenance Salaries					
0621 Operation & Maintenance Supplies					
0622 Fuel for Building					
0631 Utilities					
0639 Other Expenses					
0643 Instructional Equipment					
0644 Noninstructional Equipment					
0650 Contracted Services					
Total 0600					
0800 FIXED CHARGES					
0831 Employe Retirement					
0832 Social Security					
0833 Workmen's Compensation					
0834 Employe Insurance					
0836 Fire Insurance					
0836 Other Insurance					
0838 Rent					
0839 Other Fixed Charges					
Total 0800					
0900 FOOD SERVICE					
0962 Supplementary Feeding					
Total 0900					
1200 CAPITAL OUTLAY					
1243 Instructional Equipment					
1244 Noninstructional Equipment					
Total 1200					
TOTAL COSTS					
Cost (for Department use)					
AVERAGE DAILY MEMBERSHIP					
Cost (for Department use)					
NUMBER ENROLLED					
Cost (for Department use)					
TOTAL ANNUAL HOURS OF INSTRUCTION FOR EACH PUPIL					
Total Number of IU Classes in Each Category					
Total Number of Itinerant Teachers in Each Category					
Total Enrolled Pupils in District Operated Classes in Each Category					

Commonwealth of Pennsylvania
DEPARTMENT OF EDUCATION
Bureau of Educational Administration
and Management Support Services

SPECIAL CLASS INSTRUCTION COSTS
19___ - 19___ OPERATION

ADMIN. UNIT PDE CODE

COUNTY

SCHOOL DISTRICT

APPLICATION FOR REIMBURSEMENT IN SCHOOL YEAR 19___ - 19___ ON ACCOUNT OF DISTRICT OPERATION DURING THE PRECEDING SCHOOL YEAR 19___ - 19___ OF A PREAPPROVED COURSE OR COURSES FOR EXCEPTIONAL CHILDREN

INSTRUCTIONS: Submit five copies of the completed calculations to the responsible superintendent who will forward four copies of the computation to the Bureau of School Accounting and Subsidies, Department of Education, Box 3, Harrisburg, Pa. 17108. Computations should be made in accordance with directions on back of this form.

INSTRUCTIONAL LEVEL		ELEM. & SEC.	ELEMENTARY SCHOOLS					SECONDARY SCHOOLS				
SPECIAL CLASS INSTRUCTION COSTS SPECIAL CLASS COSTS REPORTED ON APR LESS APPLICABLE EXPENDITURES FROM FEDERAL FUNDS NOT EXCLUDED FROM THE SPECIAL COSTS REPORTED ON THE APR PLUS COLUMN (1) LESS COLUMN (2) EQUALS COLUMN (3)		COLUMN F FEDERAL FUNDS NOT EXCLUDED FROM SPEC. COSTS REPORTED ON APR	SPECIAL CLASS INSTRUCTION COSTS COLUMN 1 NOT ON APR BUT INCURRED FOR BASE YEAR	 COLUMN 2 ON APR BUT NOT INCURRED FOR BASE YEAR	 COLUMN 3 INCURRED FOR PRECEDING SCHOOL YEAR ONLY	COLUMN 4 INSTR. COSTS, EXCLUSIVE OF SPEC. CLASS COSTS, INCURRED FOR PRECEDING YEAR	FOR PDE USE ONLY	SPECIAL CLASS INSTRUCTION COSTS COLUMN 1 NOT ON APR BUT INCURRED FOR BASE YEAR	 COLUMN 2 ON APR BUT NOT INCURRED FOR BASE YEAR	 COLUMN 3 INCURRED FOR PRECEDING SCHOOL YEAR ONLY	COLUMN 4 INSTR. COSTS, EXCLUSIVE OF SPEC. CLASS COSTS, INCURRED FOR PRECEDING YEAR	FOR PDE USE ONLY
ADMINISTRATION - SUPPLIES	0121											
INSTRUCTION												
Salaries, Principals	0211											
Salaries, Supervisors or Coordinators	0212											
Salaries, Teachers, Other Professional Instruction Staff	0213,0214,0216											
Salaries - Instructional and Non-instructional Assistants to Instruction Staff	0218,0219											
Textbooks, Audio-Visual Aids	0221,0224											
Supplies, Multimedia Units	0225, 0222,0229											
Contracted Services,- Instruction	0250											
PUPIL PERSONNEL SERVICES - SALARIES												
Directors, Coordinators, Supervisors	0311											
Guidance & Psychological Personnel	0313											
Clerical & Other Classified Personnel	0319											
OPERATION & MAINTENANCE SUPPLIES	0621											
FIXED CHARGES - INSTRUCTIONAL EMPLOYES												
Employer Share of Retirement (Prorata)	0831											
Employer Share of Soc. Security (Prorata)	0832											
TOTALS OF INSTRUCTION COSTS												
EQUIV. FULL-TIME ADM. COMPUTED ON BACK												
ACTUAL INSTRUCTION COST PER PUPIL												

FOR DEPARTMENTAL USE ONLY

ADM Approved for Payment - Division of Special Education	Total Equivalent ADM - DEBE-634	Instruction cost per special class pupil as approved for reimbursement by the Department of Education in the budget for classes or schools for exceptional children for the school year in which the class is operated.
_____ Elementary _____ Secondary _____ Itin	_____ Elementary _____ Secondary	_____ Elementary _____ Secondary

I hereby certify that the Instruction Costs per pupil as computed in this application for reimbursement on account of preapproved special classes operated by the designated district or system during the preceding school year are based on the records for that school year and are calculated in accordance with the provisions of Section 2509 of the 1949 Public School Code, as amended.

DATE SUBMITTED	SIGNATURE AND ADDRESS OF SECRETARY	SIGNATURE OF RESPONSIBLE SUPERINTENDENT

DEBE-630 (8/79)

INSTRUCTIONS

1. Computations shall be based on the instruction costs of pre-approved special classes incurred for the preceding school year only, as reported and itemized on the annual financial report submitted for that school year, less current expenditures from federal funds for special classes not excluded from elementary special and/or secondary special costs on the annual financial report and shall include unpaid obligations for special classes incurred for the school year but shall exclude those expenditures for special classes made during that school year which were incurred for other school years. These special class instruction costs shall be contrasted with the instruction costs of the school system, exclusive of these special class costs, as incurred for that school year at the same level of instruction.
2. The amounts shown in columns 3 of the calculations shall be applicable costs for classes in special education as incurred for the immediately preceding school year only. Compute each item of applicable instruction costs of special classes as follows: From the expenditures for special classes listed at the designated level in the annual financial report of the preceding school year, subtract current expenditures from federal funds for special classes not excluded from Elementary Special and Secondary Special costs on the annual financial report; Add column 1, special class costs for the item as incurred for that school year but not included in expenditures shown on the annual financial report; subtract column 2, special class expenditures for the item included in the annual financial report but actually incurred for any school year other than the one immediately preceding. If the exact expenditure for special classes as shown on the annual financial report is not the basis of the calculation, additional data should be submitted to justify the amount used.
3. Submit Special Class Instruction Costs at one elementary and/or one secondary level of instruction only. If more than one special class is operated at a certain level of instruction, combine the district costs as well as the equivalent full-time average daily membership of all special classes operated at that level to compute a single special class instruction cost for that level of instruction. The average daily membership of special classes must be reconcilable with the data reported on attendance Form DEBE-483. Report the equivalent full-time ADM in special classes operated from federal funds in column F.
4. The sum of the net special class instruction costs (column 3) and the net instruction costs exclusive of special class costs (column 4) at each level of instruction for each item listed on this calculation should equal the amount shown for the corresponding item and respective level of instruction in column 3 on the approved Tuition Rate Calculations, Form DEBE-634.
5. The sum of the equivalent full-time average daily membership in special classes and the equivalent full-time average daily membership in regular classes should equal the total equivalent full-time average daily membership for each level of instruction as reported on the annual attendance reports and used on Form DEBE-634.
6. Exclude from the computation all expenditures for summer schools, adult education, community colleges, homebound instruction, extension recreation and other programs, and expenditures from federal funds.

COMPUTATION OF EQUIVALENT FULL-TIME MEMBERSHIP:

19____ - 19 ____ School Year

A. Membership in Reimbursable District-Operated Special Education Classes (Do not include itinerant programs)

	Federal Funds		Elementary		Secondary	
	Elem.	Sec.	Gifted	Other	Gifted	Other
Total days school was in session during the school year						
Aggregate full days of membership of special class pupils reported on DEBE-482						
Percentage of school day which special pupils are assigned to special classes*						
Aggregate days of equivalent full-time membership in special classes						
Equivalent full-time ADM in special classes as reported on DEBE-483						

*When a pupil is assigned part of the day or week to special classes with a special class teacher other than an itinerant teacher and is assigned the remainder of the day or week to regular classes, the percentage of time in special class may be computed by dividing the number of hours per week in special classes by the total number of hours in the weekly schedule. If this percentage is not constant for all special class pupils, report the average percentage computed as follows:

Example: 20 pupils @ 75% = 15 Equivalent Full-Time Days
10 pupils @ 50% = 5 Equivalent Full-Time Days
30 pupils = 20 Equivalent Full-Time Days

average percentage = $\frac{20}{30}$ = 66-2/3%

40 pupils @ 10% = 4 Equivalent Full-Time Days
30 pupils @ 20% = 6 Equivalent Full-Time Days
70 pupils = 10 Equivalent Full-Time Days

average percentage = $\frac{10}{70}$ = 14-2/7%

B. Membership in Reimbursable District-Operated Itinerant Special Classes

School Organization	Example	Elementary		Secondary	
Average number of pupils taught by itinerant teachers per week during term	105				
Number of periods per week that instruction is provided for the individual pupil	1				
Number of minutes per period in special class	25*				
Total number of minutes in all classes weekly for the average pupil	1750				
Equivalent full-time average daily membership (Cols. 1 X 2 X 3 ÷ Col. 4)	*1.500				

*105 X 1 X 25 ÷ 1750 = 1.500
If the length of class time varies, data may be computed in separate columns.

APPENDIX C

TABLE 18

1974-75 INTERMEDIATE UNIT SPECIAL EDUCATION COST PER ADM

Elementary

IU	EMR	IU	TMR	IU	PH	IU	SED	IU	BI
23	$5,599	22	$5,660	17	$6,775	3	$5,679	22	$5,353
3	2,820	16	5,304	3	6,070	25	5,388	25	5,204
26	2,802	26	4,255	23	5,570	26	5,304	26	5,131
4	2,619	27	3,861	16	4,530	2	5,069	4	5,074
27	2,339	3	3,822	2	4,246	6	4,993	17	4,536
16	2,280	15	3,708	15	4,046	15	4,926	10	4,261
14	2,211	18	3,459	10	4,042	4	4,475	7	4,203
19	2,087	23	3,384	12	3,783	1	4,247	2	4,177
1	2,068	10	3,261	26	3,713	22	4,103	19	3,961
24	2,043	11	3,075	13	3,446	10	3,985	16	3,822
10	2,039	25	3,021	19	3,225	27	3,899	27	3,745
5	1,999	14	2,796	22	3,171	21	3,832	5	3,554
20	1,921	2	2,794	8	3,014	14	3,783	15	3,530
21	1,912	12	2,695	6	2,984	13	3,731	21	3,495
2	1,893	17	2,602	7	2,968	28	3,708	3	3,150
18	1,741	21	2,562	18	2,899	23	3,572	28	3,144
17	1,674	8	2,561	28	2,877	7	3,544	23	3,130
9	1,626	28	2,499	21	2,636	12	3,408	18	3,079
6	1,597	1	2,498	5	2,532	8	3,290	20	3,041
25	1,545	24	2,479	1	2,413	24	3,202	12	2,962
7	1,512	4	2,443	9	2,351	19	3,107	14	2,863
8	1,466	13	2,288	24	2,292	20	3,089	24	2,832
12	1,397	9	2,215	14	2,275	5	2,994	1	2,788
29	1,041	7	2,174	4	2,170	17	2,947	8	2,585
		20	2,155	25	2,144	9	2,593	13	2,414
		5	2,144	27	2,034	18	2,534	6	2,255
		19	2,028	20	1,928	29	1,812	9	2,168
		6	1,666	29	1,457	16	1,308	11	2,151
		29	1,435					29	1,403
Average	$2,092	Average	$2,926	Average	$3,271	Average	$3,733	Average	$3,449
Median	1,960	Median	2,602	Median	2,976	Median	3,720	Median	3,150

TABLE 19

1974-75 INTERMEDIATE UNIT SPECIAL EDUCATION COST PER ADM

Secondary

IU	EMR	IU	TMR	IU	PH	IU	SED	IU	BI
27	$2,819	26	$4,349	22	$6,621	20	$8,293	29	$5,334
26	2,761	3	3,299	13	6,194	25	5,981	9	5,006
19	2,253	18	3,161	26	5,791	3	5,583	15	4,749
9	2,223	15	3,086	25	5,155	2	5,042	2	4,125
25	2,185	10	2,849	20	4,621	12	4,930	14	4,017
15	2,105	2	2,840	2	4,247	10	4,924	10	3,479
4	2,086	22	2,706	15	4,138	29	4,131	12	3,117
21	2,060	14	2,613	29	4,117	18	4,058	16	2,947
10	2,051	23	2,580	7	4,114	13	3,887	5	2,582
14	1,916	27	2,531	4	3,999	15	3,679	18	2,459
3	1,878	17	2,386	21	3,754	5	3,507	23	2,445
2	1,862	19	2,341	5	3,531	21	3,421	8	2,356
8	1,854	21	2,302	19	3,515	24	3,314	13	2,285
17	1,708	20	2,293	1	3,388	23	3,090	25	1,783
12	1,689	12	2,161	18	3,201	14	2,887	21	1,529
1	1,677	7	2,151	27	3,165	19	2,463	24	1,470
20	1,645	4	2,151	24	3,115	3	2,438	3	1,403
5	1,566	25	2,125	17	3,067	8	2,218		
18	1,538	24	2,103	23	2,962	7	2,049		
7	1,419	29	2,076	28	2,877	26	1,976		
16	1,347	1	2,004	3	2,536				
6	1,288	13	1,858	8	2,077				
29	1,282	6	1,735						
28	1,122	5	1,718						
		8	1,536						
		9	1,396						
		16	1,243						
		28	1,241						
Average	$1,847	Average	$2,316	Average	$3,918	Average	$3,894	Average	$3,005
Median	1,858	Median	2,227	Median	3,643	Median	2,593	Median	2,582

TABLE 20

1975-76 INTERMEDIATE UNIT SPECIAL EDUCATION COST PER ADM

Elementary

IU	EMR	IU	TMR	IU	PH	IU	SED	IU	BI
15	$3,505	3	$4,413	3	$7,974	2	$8,532	26	$7,784
16	3,480	26	4,217	23	7,871	12	6,183	25	6,531
26	2,892	23	4,201	26	6,360	16	5,963	1	6,003
23	2,578	2	4,148	2	5,768	26	5,467	19	5,672
4	2,458	12	4,029	6	5,048	6	5,062	2	5,143
1	2,435	16	3,960	17	4,793	27	4,709	22	4,829
2	2,285	18	3,944	16	4,500	13	4,569	12	4,316
3	2,188	15	3,680	8	4,055	7	4,499	14	4,082
14	2,096	14	3,540	21	3,702	14	4,475	5	3,982
19	2,060	22	3,495	25	3,699	18	4,331	17	3,891
17	2,021	1	3,350	18	3,660	3	4,293	9	3,872
5	1,954	10	3,289	7	3,589	15	4,255	24	3,713
18	1,940	20	3,263	15	3,513	1	3,963	10	3,667
12	1,911	21	3,113	20	3,423	17	3,940	20	3,628
21	1,897	11	3,069	13	3,394	10	3,830	6	3,571
24	1,848	6	2,952	5	3,377	9	3,802	18	3,546
10	1,830	8	2,925	28	3,323	20	3,788	13	3,503
9	1,708	24	2,924	22	3,146	23	3,753	7	3,460
27	1,696	4	2,821	29	2,989	21	3,718	11	3,449
8	1,685	25	2,816	12	2,902	28	3,663	16	3,380
7	1,683	13	2,802	9	2,868	25	3,534	4	3,367
25	1,597	7	2,769	27	2,711	8	3,489	8	3,364
6	1,460	17	2,742	4	2,593	4	3,480	23	3,303
29	1,405	19	2,664	24	2,532	22	3,371	15	3,297
20	1,371	27	2,469	10	2,402	5	3,336	21	3,213
		28	2,456	19	2,398	24	3,204	27	2,737
		9	2,390	1	2,297	19	2,967	3	2,420
		5	2,225			29	2,500	28	2,166
		29	2,034					29	2,096
Average	$2,079	Average	$3,196	Average	$3,885	Average	$4,238	Average	$3,931
Median	1,940	Median	3,069	Median	3,423	Median	3,875	Median	3,571

TABLE 21

1975-76 INTERMEDIATE UNIT SPECIAL EDUCATION COST PER ADM

Secondary

IU	EMR	IU	TMR	IU	PH	IU	SED	IU	BI
15	$5,381	26	$4,215	12	$8,507	2	$6,560	1	$6,528
23	4,188	3	4,211	26	6,365	24	5,914	20	5,917
14	2,937	2	4,017	22	6,227	26	5,412	2	5,493
26	2,892	15	3,590	3	4,897	3	5,374	12	5,262
4	2,667	20	3,369	13	4,646	20	5,190	15	5,110
21	2,565	6	3,165	4	4,638	15	4,928	3	4,142
9	2,502	22	3,025	1	4,519	14	4,363	16	4,034
17	2,478	21	3,001	18	4,318	25	4,233	5	3,982
28	2,385	23	2,958	17	4,277	18	4,165	23	3,891
12	2,226	10	2,938	8	4,045	10	4,084	18	3,473
3	2,137	8	2,930	19	3,582	12	3,552	10	3,248
16	2,120	27	2,910	28	3,506	29	3,498	17	3,233
19	2,097	4	2,904	5	3,377	27	3,477	14	3,221
8	2,078	9	2,840	21	3,366	5	3,366	25	3,040
6	2,065	18	2,702	25	3,260	13	3,286	9	2,986
18	2,000	16	2,698	7	3,186	8	3,068	7	2,747
27	1,959	19	2,655	20	3,087	19	2,934	8	2,559
5	1,924	25	2,425	2	3,081	23	2,923	21	2,380
2	1,863	28	2,327	15	3,007	21	2,615	19	2,285
7	1,845	13	2,317	27	2,916	7	2,413	13	1,999
1	1,833	1	2,308	29	2,558	22	1,965	24	1,655
10	1,691	5	2,225	23	2,542				
20	1,647	14	2,100	24	2,249				
25	1,539	24	2,074						
29	1,452	12	2,059						
		7	2,054						
		17	2,031						
		29	1,796						
Average	$2,338	Average	$2,780	Average	$4,007	Average	$3,968	Average	$3,675
Median	2,097	Median	2,771	Median	3,506	Median	3,552	Median	3,248

TABLE 22

1974-75 INTERMEDIATE UNIT SPECIAL EDUCATION AVERAGE CLASS COSTS

Elementary

IU	EMR	Number of Classes	IU	TMR	Number of Classes	IU	PH	Number of Classes	IU	SED	Number of Classes	IU	BI	Number of Classes
3	$34,017	47	16	$46,932	9	3	$53,620	6	10	$42,376	5	16	$29,726	18
26	33,592	254	12	41,760	14	23	47,516	5	6	20,991	1	20	29,197	16
16	29,642	6	27	41,279	7	17	33,877	2	16	36,335	.5	26	29,129	34
14	28,140	9	3	40,136	20	15	31,421	3	26	33,595	66	27	28,949	9
23	27,490	1	11	37,926	6	21	31,367	2	2	33,229	23	22	26,104	13
20	25,905	11	22	36,414	3	20	29,409	2	1	30,066	9	15	25,447	49
27	24,856	14	18	34,186	10	18	28,709	5	15	29,393	11	25	25,410	29
21	24,639	3	2	33,833	10	25	28,518	4	20	29,325	13	17	25,104	15
2	23,510	79	26	33,597	164	2	28,491	12	23	29,323	28	3	24,208	76
10	22,175	11	23	31,442	5	7	27,651	4	3	28,139	44	2	24,091	25
19	21,453	31	15	31,426	16	22	27,641	6	21	27,064	6	12	24,009	41
1	21,107	6	20	28,695	8	16	26,047	2	13	26,946	9	24	23,930	40
5	20,479	20	14	27,979	8	28	25,890	2	14	26,366	4	7	23,610	11
9	19,935	18	8	27,105	12	13	25,841	2	28	25,956	1	21	23,217	13
6	19,814	3	17	26,895	12	4	25,605	1	27	24,084	4	23	22,746	39
24	19,407	2	7	25,726	12	6	24,976	1	24	23,484	15	4	22,715	13
18	18,657	22	4	25,286	6	26	24,914	76	22	22,812	5	13	21,614	22
25	18,072	4	28	24,390	9	27	24,458	2	4	22,175	3	10	21,601	21
12	17,625	11	21	23,975	6	24	23,683	3	12	21,294	17	11	21,514	2
8	17,364	32	24	23,547	14	10	23,530	2	8	20,565	4	29	21,441	4
7	17,307	39	10	23,033	10	8	23,355	4	5	20,439	10	14	19,757	17
29	16,995	11	13	22,255	11	1	23,233	7	11	20,224	1	8	18,631	25
17	16,950	24	1	21,490	17	12	20,002	3	19	20,153	7	6	18,437	4
			9	20,572	3	19	19,605	5	9	19,546	1	5	18,419	22
			5	20,514	11	5	18,413	30	7	18,815	9	18	18,283	16
			6	20,438	8	14	17,061	1	29	18,139	4	19	16,804	14
			19	20,153	17	9	16,456	1	25	17,459	15	1	16,665	16
			25	19,264	13	29	12,795	3	17	16,913	2	9	14,430	22
			29	18,759	4				18	13,440	7	28	13,204	5
Average	$22,571	658	Average	$28,586	445	Average	$26,099	199	Average	$22,767	324.5	Average	$22,358	631
Median	$21,107		Median	$26,895		Median	$25,605		Median	$24,087		Median	$22,746	

TABLE 23

1974-75 INTERMEDIATE UNIT SPECIAL EDUCATION AVERAGE CLASS COSTS

Secondary

IU	EMR	Number of Classes	IU	TMR	Number of Classes	IU	PH	Number of Classes	IU	SED	Number of Classes	IU	EI	Number of Classes
26	$33,595	238	15	$45,773	9	29	$44,789	1	26	$33,596	8	14	$33,970	4
25	28,418	2	3	38,443	23	15	36,410	3	25	32,746	8	25	27,116	5
3	28,233	68	27	36,955	5	22	35,089	1	27	29,485	1	24	26,872	7
2	27,683	82	17	34,687	4	23	33,910	1	10	26,984	2	15	25,567	2
27	24,567	18	26	33,597	40	2	33,671	11	24	25,687	4	2	23,572	2
21	21,993	8	25	32,093	7	18	33,176	2	13	25,655	5	21	22,990	2
14	20,585	15	29	31,671	2	7	32,915	1	12	25,364	5	18	22,893	2
5	20,464	19	14	30,565	4	1	30,495	2	21	25,188	6	16	22,595	3
19	20,338	35	2	29,537	14	26	29,130	33	8	25,140	1.5	13	20,568	5
10	20,327	16	16	27,349	3	21	28,290	2	20	24,877	4	23	19,677	19
20	20,131	20	24	26,710	10	25	27,116	5	15	23,376	8	10	18,900	8
4	19,889	15	22	26,431	6	19	27,068	2	2	22,442	20	5	18,441	4
28	19,642	2	28	26,389	3	24	26,998	3	14	20,880	5	20	18,192	1
1	19,413	35	10	25,988	3	17	25,928	1	5	20,458	7	29	17,782	3
16	18,854	11	13	24,954	7	13	24,775	1	3	20,396	25	8	17,276	6
18	18,086	16	21	24,725	4	27	24,559	1	19	20,339	7	12	16,705	8
7	18,024	47	1	24,249	8	4	23,996	1	23	19,950	19	17	15,196	2
29	17,954	10	7	23,781	13	20	22,643	2	18	19,053	2	3	13,960	20
17	17,535	21	23	23,311	10	8	21,805	2	7	18,556	2	9	11,965	7
12	17,317	13	4	22,591	6	3	18,862	16	29	17,971	4			
9	17,309	17	12	22,234	14	5	18,434	.5						
8	17,185	48	20	22,089	6									
6	15,119	3	18	21,633	9									
15	12,627	1	19	20,339	10									
			5	20,276	5									
			6	19,119	11									
			8	17,248	13									
			9	15,612										
Average	$20,683	759	Average	$26,727	252	Average	$28,574	91.5	Average	$23,907	143.5	Average	$20,749	110
Median	$19,765		Median	$25,471		Median	$28,290		Median	$24,126		Median	$19,677	

TABLE 24

1975-76 INTERMEDIATE UNIT SPECIAL EDUCATION AVERAGE CLASS COSTS

Elementary

IU	EMR	Number of Classes	IU	TMR	Number of Classes	IU	PH	Number of Classes	IU	SED	Number of Classes	IU	BI	Number of Classes
16	$34,799	6	3	$45,230	20	23	$60,343	6	20	$39,922	13	27	$34,285	7
26	29,625	200	15	38,779	13	26	59,362	45	14	38,785	3	6	32,141	3
15	28,041	1	2	37,675	12	16	40,500	1	9	38,024	1	18	30,259	11
14	28,040	9	26	36,884	170	17	38,346	1	26	37,098	56	2	30,189	30
3	27,999	44	14	34,614	9	21	37,024	1	25	35,138	14	24	28,622	48
19	26,784	21	20	34,466	10	20	36,516	3	2	35,074	27	21	28,422	13
23	25,777	1	18	34,179	9	22	36,483	5	23	28,697	34	26	28,409	97
21	25,288	3	16	33,333	12	3	36,382	16	6	28,682	3	11	27,592	2
24	24,019	1	27	32,104	7	2	34,285	18	10	28,344	5	16	27,224	18
2	23,355	85	23	31,511	4	18	33,670	5	3	28,286	43	23	26,424	36
18	21,634	20	22	31,456	3	7	33,200	4	24	27,833	16	22	26,400	15
10	21,299	11	24	30,950	12	19	31,969	3	22	26,968	5	20	26,085	21
7	20,829	37	7	30,464	11	24	30,379	3	7	26,939	10	19	25,743	7
6	20,446	1	21	29,625	5	6	30,289	2	18	26,709	6	17	25,601	19
4	20,368	14	6	29,149	8	27	29,822	2	4	26,683	3	15	25,399	44
17	19,951	23	12	29,070	14	13	28,849	2	1	26,091	12	25	24,937	22
29	19,923	11	17	29,016	12	8	28,384	3	21	26,025	6	3	24,668	77
1	19,883	6	10	28,501	9	12	27,569	1	13	24,924	11	13	24,520	25
25	19,740	4	11	28,005	7	15	26,931	3	16	23,851	4	7	23,924	15
20	19,198	15	8	27,672	13	28	26,585	1	15	23,207	11	5	23,719	23
9	18,994	17	25	27,220	12	4	25,670	1	27	22,367	4	12	23,655	52
8	18,730	35	1	26,601	17	25	25,101	4	28	21,976	2	10	23,419	23
27	18,087	15	18	26,295	13	10	24,015	2	12	21,902	19	4	23,121	15
12	17,777	10	28	25,170	8	29	21,923	3	17	21,669	2	9	22,739	24
5	17,679	21	29	24,911	4	9	21,507	2	5	21,497	9	14	22,676	27
			19	23,178	10	5	20,935	5	19	21,141	8	29	22,533	8
			4	22,968	7	1	17,996	6	29	21,000	5	8	20,854	30
			9	22,706	4				8	20,937	4	1	20,737	16
			5	21,140	10							28	17,763	5
Average	$22,731	611	Average	$30,099	445	Average	$31,964	148	Average	$27,492	336	Average	$25,692	733
Median	$20,829		Median	$29,149		Median	$30,289		Median	$26,693		Median	$25,399	

TABLE 25

1975-76 INTERMEDIATE UNIT SPECIAL EDUCATION AVERAGE CLASS COSTS

Secondary

IU	EMR	Number of Classes	IU	TMR	Number of Classes	IU	PH	Number of Classes	IU	SED	Number of Classes	IU	BI	Number of Classes
3	$33,151	62	15	$48,624	11	26	$57,535	25	2	$40,253	22	23	$35,017	15
14	29,919	16	27	43,725	5	1	42,929	2	20	37,302	2	2	32,223	15
26	29,724	234	3	41,089	33	3	40,402	12	26	37,257	26	15	30,662	5
2	29,398	76	2	39,944	18	2	38,738	7	15	36,332	9	16	30,255	4
16	28,329	11	26	36,698	51	7	38,232	1	24	31,048	4	14	28,988	3
21	25,288	7	5	35,605	5	22	37,361	1	23	30,047	12	24	28,957	6
19	24,334	38	14	33,594	4	21	37,024	1	3	29,624	37	5	27,078	5
15	24,214	4	20	32,184	7	29	35,811	1	5	29,464	6	12	24,993	8
10	23,144	16	28	31,641	5	25	34,770	3	14	29,089	6	20	24,695	1
23	23,035	2	17	31,487	4	18	34,547	2	13	28,749	8	18	24,308	4
27	22,790	19	23	31,274	7	24	33,730	2	18	27,078	2	10	23,821	9
4	22,578	15	16	30,578	3	23	33,039	1	10	24,505	2	21	23,801	3
17	21,402	22	13	30,347	10	20	32,780	1	25	21,637	9	8	23,050	6
18	21,204	15	6	29,894	13	5	30,389	1	22	21,615	2	3	22,780	34
1	21,159	35	21	29,265	4	17	29,940	1	19	21,513	9	17	22,630	5
20	21,129	21	22	29,238	6	12	29,775	2	21	20,921	6	25	20,771	6
7	21,004	44	29	27,839	2	27	29,162	1	27	20,864	1	13	20,272	5
29	20,473	10	8	27,050	13	19	28,657	2	12	19,891	5	1	19,585	2
6	19,621	2	25	26,678	9	28	28,051	1	7	18,338	5	7	16,485	2
25	19,244	2	12	26,030	14	13	27,873	1	8	14,315	3	19	14,852	2
8	18,704	47	7	25,915	13	4	27,826	1						
12	17,955	15	4	24,889	7	15	27,061	3						
9	17,932	18	1	24,469	10	8	25,284	4						
28	17,491	1	10	23,506	4									
5	16,931	15	18	23,420	9									
			19	22,234	16									
			24	21,797	9									
			9	20,283	3									
Average	$22,806	747	Average	$30,332	297	Average	$33.953	76	Average	$26,581	180	Average	$24,506	142
Median	$21,402		Median	$29,579		Median	$33,039		Median	$27,078		Median	$23,821	

APPENDIX D

CORRELATION MATRIX - EMR
(N = 132)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1. Instructional Level																																	
2. Type of Community	-13																																
3. Administrative Costs	-07	-14																															
4. Instructional Costs	00	-04	19																														
5. Other Instructional Costs	19	-02	24*	-10																													
6. Support Costs	-01	-11	75*	02	36*																												
7. Materials Costs	15	-11	52*	-14	23*	49*																											
8. Remaining Costs	-06	-08	81*	02	31*	81*	56*																										
9. Salary Costs	00	-04	07	68*	-07	03	-10	-04																									
10. Total	01	-11	75*	61*	31*	70*	41*	73*	57*																								
11. Instructional Process	-18	05	16	-07	01	07	26*	23*	-11	08																							
12. Instructional Setting	-47*	02	27*	-07	03	18	30*	38*	-08	19	64*																						
13. Administrative Support	-13	-18	12	-00	-14	10	26*	20*	01	12	29*	49*																					
14. Integration in Regular Classroom	03	04	-24*	-07	-01	-14	-04	-21*	-26*	-25*	07	07	14																				
15. Total Score	-30*	-01	13	-08	-03	09	29*	24*	-17	06	78*	85*	64*	43*																			
16. Years of Teaching Experience	01	-04	04	61*	-07	02	-16	-01	71*	44*	-12	-14	-15	-31*	-25*																		
17. Years of Special Education Experience	09	-04	10	52*	12	12	-11	07	70*	49*	-21*	-19	-18	-33*	-32*	86*																	
18. Sex	-01	-00	03	-04	-00	02	07	07	01	03	-03	-03	06	-09	-04	-06	-05																
19. IQ	02	02	-06	-15	-05	-01	-00	-09	-11	-15	-11	-08	-05	06	-07	-14	-06	-07															
20. Chronological Age	84*	-18	-12	-01	13	-04	13	-10	04	-02	-17	-47*	-14	06	-28*	02	09	-00	03														
21. Years in Special Education	70*	-08	-17	-01	14	-10	06	-09	04	-04	-20*	-40*	-22*	15	-26*	00	06	-02	-03	80*													
22. Pre Vineland	74*	-10	-18	-01	08	-12	05	-17	08	-07	-23*	-47*	-24*	07	-33*	07	16	-05	19	84*	84*												
23. Post Vineland	71*	-12	-05	-01	08	04	18	-04	10	04	-19	-44*	-11	-01	-29*	07	14	00	15	83*	56*	85*											
24. Pre Reading	72*	-09	-17	-08	02	-08	09	-13	-05	-13	-11	-41*	-21*	07	-25*	-02	02	-04	19	84*	65*	80*	79*										
25. Post Reading	62*	-12	-13	-04	01	-03	10	-08	02	-05	-06	-34*	-13	04	-19	-00	02	03	26*	75*	53*	74*	80*	92*									
26. Pre Spelling	72*	-09	-19	-05	05	-10	05	-14	-03	-11	-16	-45*	-19	03	-29*	06	07	01	10	84*	65*	77*	76*	93*	82*								
27. Post Spelling	69*	-13	-15	03	03	-02	07	-12	03	-04	-15	-41*	-06	06	-23*	03	05	05	20	81*	59*	75*	78*	88*	88*	87*							
28. Pre Arithmetic	74*	-08	-16	-04	09	-06	06	-14	-02	-09	-17	-43*	-22*	13	-27*	-00	05	-08	27*	88*	69*	81*	82*	90*	82*	86*	83*						
29. Post Arithmetic	71*	-17	-13	-07	07	-02	09	-12	-01	-08	-16	-45*	-19	09	-27*	-01	06	-03	26*	86*	60*	82*	84*	88*	84*	85*	84*	92*					
30. Vineland Gain	-06	-03	23*	-00	-03	28*	24*	25*	04	21*	09	06	25*	-16	07	-01	-04	10	-08	-04	-15	-28*	26*	-02	10	-03	04	01	03				
31. Reading Gain	-17	-08	06	11	-02	14	05	10	21*	19	12	14	17	-07	12	06	02	17	21*	-13	-21*	-06	10	-09	30*	-17	12	-09	00	30*			
32. Spelling Gain	-19	-05	11	16	-06	16	03	07	12	16	04	16	26*	06	17	-06	-06	06	17	-21*	-24*	-19	-12	-26*	-04	-43*	08	-22*	-18	14	55*		
33. Arithmetic Gain	-25*	-18	09	-05	-07	10	06	08	01	04	07	05	11	-13	04	-01	-01	12	-10	-25*	-36*	-14	-13	-24*	-13	-22*	-17	-41*	-02	03	24*	14	

*Indicates significance beyond .05 level.

CORRELATION MATRIX - TMR
(N = 54)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1. Instructional Level																											
2. Type of Community	-11																										
3. Administrative Costs	-03	12																									
4. Instructional Costs	11	-18	31*																								
5. Other Instructional Costs	-17	09	63*	54*																							
6. Support Costs	10	23	44*	-19	16																						
7. Materials Costs	-10	18	22	32*	54*	25																					
8. Remaining Costs	-01	-09	55*	32*	49*	00	38*																				
9. Salary Costs	11	06	15	71*	21	-24	09	04																			
10. Total	02	-02	66*	80*	76*	04	51*	74*	57*																		
11. Instructional Process	19	21	13	14	08	-17	04	16	24	20																	
12. Instructional Setting	14	27	25	23	14	06	47*	20	35*	35*	36*																
13. Administrative Support	08	27	34*	16	14	-21	14	30*	25	32*	55*	51*															
14. Integration in Regular Classroom	-04	23	13	-01	09	-22	02	22	21	18	47*	20	37*														
15. Total Score	13	33*	28	18	15	-16	25	28*	36*	35*	80*	73*	79*	66*													
16. Years of Teaching Experience	-03	06	18	53*	28	-06	-13	-10	69*	35*	-01	-00	04	-14	-04												
17. Years of Special Education Experience	-01	02	13	56*	22	-13	-13	-12	76*	35*	01	06	04	-18	-01	93*											
18. Sex	-03	02	-02	-12	-08	16	-07	-11	-08	-12	-05	-02	-13	-18	-11	00	-03										
19. I Q	-24	08	06	04	-04	-17	-11	-08	06	-03	39*	11	22	36*	36*	09	06	08									
20. Chronological Age	81*	-00	-09	01	-15	08	-04	09	03	01	10	21	14	-15	12	04	06	-08	-20								
21. Years in Special Education	71*	12	-03	04	-08	21	01	11	04	07	03	11	02	-26	-01	13	15	-04	-29	83*							
22. Pre Vineland	64*	-08	-23	03	-24	-03	-02	01	11	-04	11	07	03	-11	05	08	14	01	07	79*	68*						
23. Post Vineland	71*	-01	-23	-00	-20	04	03	-08	01	-10	08	14	18	-09	11	-04	01	-06	03	79*	62*	86*					
24. Pre Performance Profile	39*	26	-02	10	-07	06	14	03	06	05	27	24	28	-03	27	07	08	20	34*	56*	47*	71*	64*				
25. Post Performance Profile	39*	24	11	15	03	09	14	00	07	10	30	38*	43*	04	40*	05	01	14	37*	50*	40*	55*	59*	85*			
26. Vineland Gain	-10	15	07	-05	14	09	07	-17	-18	-09	-06	10	25	07	11	-20	-24	-10	-10	-27	-33*	-59*	-09	-38*	-15		
27. Performance Profile Gain	-07	-08	22	06	17	05	-02	-05	01	06	02	19	21	12	18	-04	-12	-13	00	-19	-21	-46*	-25	-42*	13	49*	

CORRELATION MATRIX - PH
(N = 32)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1. Instructional Level																																	
2. Type of Community	08																																
3. Administrative Costs	-16	-30																															
4. Instructional Costs	-20	-12	70*																														
5. Other Instructional Costs	01	-39*	29	02																													
6. Support Costs	-10	13	48*	34	33																												
7. Materials Costs	-12	-12	75*	59*	04	47*																											
8. Remaining Costs	-11	-25	89*	73*	19	53*	80*																										
9. Salary Costs	07	16	27	34	-02	37*	21	23																									
10. Total	-13	-19	90*	85*	30	63*	76*	94*	43*																								
11. Instructional Process	-06	23	11	21	-29	-15	26	08	19	10																							
12. Instructional Setting	-35	-07	33	40*	-12	21	18	17	29	29	34																						
13. Administrative Support	00	21	28	31	-16	05	30	16	28	24	45*	20																					
14. Integration in Regular Classroom	-25	-00	14	19	11	16	14	00	15	13	19	37*	26																				
15. Total Score	-29	08	31	40*	-14	13	29	14	32	27	66*	77*	56*	71*																			
16. Years of Teaching Experience	05	14	09	26	-03	11	-02	07	85*	23	-01	08	15	23	16																		
17. Years of Special Education Experience	-00	07	13	28	02	14	01	09	83*	26	-04	07	13	17	12	95*																	
18. Sex	04	-12	-24	-40	-14	-09	-35	-28	-27	-35	08	13	09	05	13	-21	-22																
19. I Q	-19	04	03	-10	15	06	-01	-10	-07	-06	-02	09	03	26	15	-02	03	27															
20. Chronological Age	80*	27	-13	-20	02	-08	-15	-14	-00	-15	02	-25	06	03	-08	06	01	03	-20														
21. Years in Special Education	61*	38	-11	-01	-10	07	-13	-05	21	-02	20	-09	09	-10	01	18	11	10	-30	82*													
22. Pre Vineland	47*	29	-22	-27	-02	-11	-12	-22	-09	-23	-19	-48*	09	01	-27	02	04	00	10	62*	41*												
23. Post Vineland	44*	33	-31	-28	02	-04	-20	-29	-04	-26	-19	-34	12	03	-18	-01	00	05	17	52*	35	89*											
24. Pre Reading	66*	16	-05	-15	19	16	-14	-09	02	-05	-03	-18	05	11	-04	01	-01	37	16	79*	65*	50*	48*										
25. Post Reading	61*	02	05	-03	11	12	04	02	15	05	06	-11	12	17	07	11	09	25	12	70*	53*	44*	43*	91*									
26. Pre Spelling	68*	29	-12	-16	06	05	-19	-13	12	-10	10	-15	09	10	03	10	04	38	17	78*	67*	50*	48*	94*	87*								
27. Post Spelling	55*	10	-06	-15	15	15	-07	-10	12	-05	09	-11	18	34	16	11	09	42*	21	64*	48*	46*	48*	89*	92*	88*							
28. Pre Arithmetic	59*	32	-17	-24	13	04	-26	-18	-07	-17	-01	-19	02	21	00	01	-06	31	12	81*	66*	58*	50*	87*	76*	90*	80*						
29. Post Arithmetic	57*	26	-11	-16	10	06	-09	-14	07	-10	23	-12	22	32	22	10	04	15	12	78*	65*	57*	54*	86*	82*	89*	88*	93*					
30. Vineland Gain	04	09	-24	-11	-07	10	-20	-22	07	-14	-04	23	10	09	15	-08	-09	18	18	-07	-03	-01	45*	10	12	08	19	-02	06				
31. Reading Gain	08	-30	22	25	-15	-08	40	24	32	23	22	12	19	18	26	24	25	-20	-05	-02	-13	-03	-00	03	44*	08	30	-06	11	05			
32. Spelling Gain	-16	-38	10	01	19	22	24	03	03	09	-01	06	20	51*	29	03	12	13	11	-21	-32	-02	07	03	22	-12	36	-08	10	27	46*		
33. Arithmetic Gain	11	10	-17	-08	-20	-02	14	-18	19	-12	38	24	34	19	41	14	14	11	26	-02	-02	-11	11	12	29	12	34	-04	33	46*	44*	48*	

CORRELATION MATRIX - SED
(N = 28)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1. Instructional Level																																	
2. Type of Community	25																																
3. Administrative Costs	-01	-42*																															
4. Instructional Costs	01	-70*	55*																														
5. Other Instructional Costs	-04	-35	32	51*																													
6. Support Costs	25	12	12	-38*	-41*																												
7. Materials Costs	19	38	-24	11	-21	-47*																											
8. Remaining Costs	26	-26	65*	29	05	42*	-19																										
9. Salary Costs	-20	-61*	30	79*	47*	-36	-10	-13																									
10. Total	07	-63*	78*	84*	50*	04	-18	70*	58*																								
11. Instructional Process	-42*	-11	08	08	27	-15	12	-19	17	03																							
12. Instructional Setting	-52*	26	-25	-29	-15	-24	31	-26	-20	-38*	33																						
13. Administrative Support	-10	-05	-31	01	24	-09	-07	-60*	32	-20	44*	-07																					
14. Integration in Regular Classroom	-36	-39	11	43*	32	-42*	37*	-11	39*	24	40*	29	27																				
15. Total Score	-58*	-10	-11	09	25	-34	29	-39*	24	-10	81*	61*	54*	74*																			
16. Years of Teaching Experience	-10	15	22	04	-29	21	-05	-02	27	07	-05	-30	-07	-41	-28																		
17. Years of Special Education Experience	03	-19	16	28	-32	-01	07	-02	43*	14	-06	-21	-13	-13	-17	66*																	
18. Sex	10	07	26	39	41	-35	37	21	-14	30	18	19	-19	14	12	-29	-33																
19. I Q	-30	-39	06	44*	-07	-36	41	02	29	17	-26	24	-23	39	04	-02	23	03															
20. Chronological Age	90*	22	-37	-12	-36	-02	16	-21	-21	-35	-42	-43	-08	-42	-47*	-04	03	-09	-18														
21. Years in Special Education	52*	05	-15	-19	-59*	37	-14	-15	-03	-23	-21	-45*	07	-49*	-38	37	51*	-32	-34	48*													
22. Pre Vineland	80*	38	-33	-07	-47*	07	19	-15	-14	-27	-48*	-55*	-17	-49*	-58*	09	04	-12	-08	84*	47*												
23. Post Vineland	53*	44	-28	-08	-55*	12	14	-11	-12	-24	-47*	-51*	-16	-52*	-57*	27	15	-17	-01	69*	50*	89*											
24. Pre Reading	64*	-17	-23	26	-32	-21	48*	-13	10	-09	-38	-28	-17	-03	-29	-07	12	03	43	63*	13	68*	55*										
25. Post Reading	53*	-21	-12	32	-30	-19	53*	-10	19	01	-33	-24	-15	09	-21	-03	12	01	49*	49*	06	59*	46*	96*									
26. Pre Spelling	63*	-18	-27	31	-20	-36	52*	-17	13	-10	-35	-22	-17	-02	-26	-15	04	13	36	67*	05	67*	51*	95*	87*								
27. Post Spelling	51	-20	-18	39	-23	-31	53*	-07	14	02	-36	-28	-14	04	-25	-16	-01	18	46*	50*	-06	56*	43	94*	91*	92*							
28. Pre Arithmetic	72*	-11	-33	26	-34	-15	48*	-11	05	-09	-46*	-44*	-14	-11	-39	-06	14	02	25	78*	33	81*	68*	90*	83*	99*	82*						
29. Post Arithmetic	64*	-15	-23	19	-39	-01	43	-12	07	-08	-39	-33	-11	-03	-29	00	14	-08	29	59*	27	66*	47*	86*	84*	80*	77*	83*					
30. Vineland Gain	-55*	12	14	00	-14	11	-13	09	05	08	07	13	03	-03	06	38	24	-10	15	-39	04	-30	16	-39	-36	-45*	-36	-41	-49*				
31. Reading Gain	-13	-24	31	30	-04	01	30	09	35	31	07	06	02	40	20	11	05	-06	35	-31	-19	-12	-16	15	42	01	20	02	17	-04			
32. Spelling Gain	-31	-08	22	21	-10	13	03	26	04	30	-02	-16	06	15	03	-03	-11	11	29	-42	-29	-26	-18	-01	13	-17	22	-16	-05	21	48*		
33. Arithmetic Gain	17	-13	04	-03	-23	20	09	-05	04	-02	-06	03	-01	10	02	09	05	-17	18	-03	02	05	-10	29	35	19	24	10	63*	-31	29	15	

CORRELATION MATRIX - BI
(N = 20)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1. Instructional Level																																	
2. Type of Community	-25																																
3. Administrative Costs	-59*	22																															
4. Instructional Costs	06	-70*	-23																														
5. Other Instructional Costs	-49*	16	71*	-16																													
6. Support Costs	-04	01	44	-35	29																												
7. Materials Costs	58*	-68*	-60*	40	-37	-01																											
8. Remaining Costs	-08	-07	57*	15	57*	04	-08																										
9. Salary Costs	02	-43	-46*	77*	-40	-53*	30	-03																									
10. Total	-09	-45	37	59*	45	-01	19	85*	38																								
11. Instructional Process	21	-05	-36	10	-21	-22	43	-12	17	-03																							
12. Instructional Setting	10	-03	-39	07	-40	-48*	41	-23	19	-17	69*																						
13. Administrative Support	08	34	-27	-03	-11	-43	-00	-11	13	-15	60*	49*																					
14. Integration in Regular Classroom	04	44	-34	-13	-20	-01	29	-34	-06	-30	72*	53*	58*																				
15. Total Score	13	15	-41	01	-30	-33	37	-25	13	-19	91*	84*	74*	84*																			
16. Years of Teaching Experience	-30	-31	-21	42	-23	-45	06	-12	74*	19	-32	-04	-25	-37	-27																		
17. Years of Special Education Experience	-22	-70*	-04	58*	-14	-21	09	-08	57*	26	-32	-09	-51*	-59*	-40	67*																	
18. Sex	-25	51	54*	-43	31	-05	-56*	32	-37	01	-19	-14	-10	-31	-22	-16	-18																
19. I Q	14	-02	-17	-08	06	-27	35	00	-00	01	65*	65*	42	42	64*	-15	-20	08															
20. Chronological Age	93*	-01	-66*	01	-54*	12	53*	-36	00	-34	34	15	30	48	36	-34	-37	-30	18														
21. Years in Special Education	34	-21	-41	19	-48	09	25	-33	16	-23	-25	-10	-22	-04	-16	12	16	-31	-17	49													
22. Pre Vineland	87*	-07	-28	-03	-25	23	41	-04	-18	-10	31	04	16	26	22	-49	-38	-00	19	84*	25												
23. Post Vineland	73*	02	-23	02	-13	13	38	06	-12	02	36	03	36	41	31	-46	-55*	05	36	77*	21	85*											
24. Pre Reading	69*	01	-68*	-05	-58*	-14	30	-62*	06	-61*	31	21	37	31	33	-17	-20	-24	33	77*	44	56*	55*										
25. Post Reading	53	09	-64*	-22	-45	-17	27	-58*	02	-62*	42	26	39	36	40	-11	-20	-09	53*	64*	29	44	49	91*									
26. Pre Spelling	70*	19	-64*	-14	-50	-20	30	-51	-03	-58*	48	28	48	49	48	-34	-38	-05	38	84*	24	74*	71*	89*	83*								
27. Post Spelling	44	28	-51	-26	-33	-37	11	-41	-04	-53*	48	35	49	36	47	-23	-31	16	55*	56*	01	52*	53*	80*	84*	91*							
28. Pre Arithmetic	74*	12	-59*	-16	-35	-00	45	-38	-12	-44	42	24	42	50	44	-42	-44	-14	47	85*	38	73*	76*	86*	82*	92*	80*						
29. Post Arithmetic	61*	19	-57*	-22	-34	-13	28	-42	-07	-49	42	21	38	38	38	-32	-32	-05	48	71*	33	63*	65*	87*	88*	90*	88*	94*					
30. Vineland Gain	-34	16	12	08	22	-21	-08	18	12	22	07	-02	33	25	15	09	-28	09	28	-20	-10	-35	19	-07	06	-10	-02	01	00				
31. Reading Gain	-11	20	-15	-42	11	-12	03	-15	-09	-25	36	20	18	24	29	09	-08	28	61*	-04	-20	-10	06	16	55*	18	40	23	36	29			
32. Spelling Gain	-29	33	09	-32	22	-47	-34	07	-04	-08	15	25	19	-15	12	17	05	48	53*	-36	-48	-25	-17	07	29	11	52*	03	25	16	57*		
33. Arithmetic Gain	34	23	-43	-26	-25	-30	-02	-38	01	-47	32	13	25	12	22	-11	-08	08	40	37	19	35	36	70*	78*	69*	81*	66*	88*	-01	46	51	

APPENDIX E

FURTHER DISCUSSION OF COMMONALITY ANALYSES

The primary focus of this portion of the analysis was to determine the relationships among the cost, quality and effectiveness measures gathered during the study. More specifically, an effort was made to determine the effect of the cost and quality variables upon the achievement of the pupils in the study. The analysis technique used was commonality analysis.[1]

Separate analyses, using classroom mean as the unit of analysis, were performed for each category of exceptionality and each type of gain score obtained. For all these analyses, the same three sets of variables served as predictors of the criterion (gain) variance. These sets were:

(1) Background - pretest score on the measure for which gain was calculated.

(2) Quality Indicators - two-year mean scores on the four subscales:

(a) INSPROTO - Instructional process

(b) INSETTO - Instructional setting

(c) ADMSUPTO - Administrative support

(d) INTCLATO - Integration with regular classroom

(3) Cost - Total classroom cost.

1. EMR

General. The analysis of EMR two-year gain scores (Vineland and WRAT reading, spelling, and arithmetic subscales), using the three specified variable sets, accounted for 21 per cent ($p = 0.0001$) of the Vineland gain score variance, six per cent ($p = 0.2092$) of the WRAT reading gain score variance, 26 per cent ($p = 0.0000$) of the WRAT spelling gain score variance, and 21 per cent ($p = 0.0001$) of the WRAT arithmetic gain score variance. In general, the reading gains for EMRs are not nearly as subject to school effects as are the arithmetic and spelling gains, at least for this specific data base. However, reading gains cannot be attributed with any significance to pretest score; therefore, an additional background variable (or variables) is needed to account for the reading gain variance.

Vineland Gains. A sample of 132 classrooms responded to the Vineland instrument for two consecutive years. Results are shown in Table 26.

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[1]The Correlation Matrices used in the Commonality Analyses are shown in Appendix C, p. 38.

TABLE 26

Proportions of Explained Variance of Three Variable Sets on Vineland Gains for EMRs after Partitioning (Total RSQ = 0.2124)

	Variable Set 1	2	3
Unique to Set 1	.0775		
Unique to Set 2		.0984	
Unique to Set 3			.0276
Common to 1 and 2	-.0071	-.0071	
Common to 1 and 3	-.0055		-.0055
Common to 2 and 3		-.0081	-.0081
Common to 1, 2 and 3	.0135	.0135	.0135

All of the above unique contributions are significant at $\alpha = .05$. Quality of instruction appears to influence EMR social gains most, followed by pretest achievement and cost. A negative correlation between Vineland pretest and gain scores again raises the possibility of regression toward the mean. The slight negative common contributions of the variable sets are negligible in view of the significant unique contributions. What is puzzling here is the lack of background (pretest) influence on the Vineland gain scores. However, this is consistent with the exceptionality categories which follow. The cost factor is slightly influential on gain score intervals even on the school level. Most likely other direct school variables must influence student performance.

It might also be noted that correlations between the four pretest measurements for the EMR group are very highly positive. In fact, no discernible difference between the social and achievement pretest correlations is noted. However, Vineland gains do not correlate with achievement gain scores.

Reading Gains. A sample of 131 EMR classrooms responded to the WRAT reading subscale for two consecutive years. According to this specific data base, school factors contribute very little uniquely to EMR reading gains. These results are presented in Table 27.

TABLE 27

Proportions of Explained Variance of Three Variable Sets on Reading Gains for EMRs after Partitioning (Total RSQ = 0.0645)

	Variable Set 1	2	3
Unique to Set 1	.0013		
Unique to Set 2		.0254	
Unique to Set 3			.0193
Common to 1 and 2	.0034	.0034	
Common to 2 and 3		.0115	.0115
Common to 1, 2 and 3	.0035	.0035	.0035

A more important task than trying to analyze these meager results is to determine what factors significantly relate to EMR reading gains. Perhaps the home environment or intellectual ability will account for a great deal of gain score variance.

Reading pretest score with gain score correlations are negative, indicating regression toward the mean. There is a low correlation (0.1856) with cost, and only low positive correlations with the quality indicators are recorded with reading gain scores, except for a negative correlation with INTCLATO.

Spelling Gains. A sample of 132 EMR classrooms responded to the WRAT spelling subscale with results presented in Table 28.

TABLE 28
Proportions of Explained Variance of Three Variable Sets on Spelling Gains for EMRs after Partitioning (Total RSQ = 0.2567)

	Variable Set 1	2	3
Unique to Set 1	.1659		
Unique to Set 2		.0591	
Unique to Set 3			.0175
Common to 1 and 2	.0057	.0057	
Common to 2 and 3		-.0048	-.0048
Common to 1, 2 and 3	.0125	.0125	.0125

The unique contributions for variable sets 1 and 2 are significant at the $\alpha = .05$ level. Negligible common contributions are observed. Prior ability has the greatest influence on spelling gains, while significant influence is also provided by quality of instruction. Cost shows little relationship to spelling gains, correlating only 0.1613. Low, but consistent, positive correlations are observed between quality indicators and spelling gains, with the greatest relationship (0.2572) being with ADMSUPTO. Reading and spelling gains correlate as expected (0.5468).

A moderately high negative correlation is observed between spelling pretest and gain scores. This suggests a regression toward the mean effect.

Arithmetic Gains. A sample of 131 EMR classrooms responded to the WRAT arithmetic subtest with results presented in Table 29.

TABLE 29
Proportions of Explained Variance of Three Variable Sets on Arithmetic Gains for EMRs after Partitioning (Total RSQ = 0.2125)

	Variable Set 1	2	3
Unique to Set 1	.1764		
Unique to Set 2		.0455	
Unique to Set 3			.0002
Common to 1 and 2	-.0110	-.0110	

For arithmetic there is almost no overlapping of variable set contributions. Pretest accounts for 18 per cent (p = 0.0000) of the total gain score variance in arithmetic. Neither quality nor cost serves as viable contributors; in fact, cost and arithmetic gain correlate 0.0403. Arithmetic gain is related to quality indicator scores in a low positive manner, except for the negative correlation with INTCLATO.

The correlation between arithmetic pretest and gain scores is -0.4086; therefore, regression toward the mean is a serious possibility. The negative common contribution is, most likely, due to suppressor variables.

2. TMR

General. The analysis of TMR two-year gain scores (Vineland and TMR Performance Profile), using the three specified variable sets, accounted for 49 per cent of the Vineland gain score variance (p - 0.0000) and 32 per cent of the Performance Profile gain score (p = 0.0028).

Vineland Gains. A sample of 54 TMR classrooms was administered the Vineland Scale two consecutive years (1975-1976). Results are presented in Table 30.

TABLE 30
Proportions of Explained Variance of Three Variable Sets on Vineland Gains for TMRs after Partitioning
(Total RSQ = 0.4903)

	Variable Set 1	2	3
Unique to Set 1 (Pretest)	.3353		
Unique to Set 2 (Quality)		.1343	
Unique to Set 3 (Cost)			.0439
Common to 1 and 2	.0131	.0131	
Common to 1 and 3	-.0128		-.0128
Common to 2 and 3		-.0320	-.0320
Common to 1, 2 and 3	.0083	.0083	.0083

As would be expected, "school effects" accounts for only 49 per cent of Vineland gains. Of these school effects, prior learning or experience accounts for about 34 per cent of Vineland gains and quality of instruction accounts for 13 per cent of Vineland gains. Cost of instruction accounts for four per cent of the gain and is still statistically significant at the .05 alpha level.

The common contributions are rather small when examined for uniqueness. However, sets 1 and 2 account for almost all the variance associated with gains; the cost factor adds very little to the overall formula. The negative joint contributions are, most probably caused by an unidentified suppressor variable, since the correlation between variable sets 2 and 3 is moderately high positive and the correlation between sets 1 and 2 is a very low negative.

A serious problem arises in the TMR data concerning the pretest-gain score relationship. While pretest accounts uniquely for 34 per cent of the gain score variance, the actual correlation between gain score and pretest

score is -0.5865. This suggests a serious regression toward the mean effect or, possibly, a ceiling effect imposed by collapsing over all grade levels. However, the same patterns are obtained when elementary and secondary TMR data are examined separately for both years. Therefore, a ceiling effect, if it does exist, stems from chronological age rather than grade level. Regression toward the mean remains a challenge to the validity of the analysis.

TMR Performance Profile Gains. A sample of 57 TMR classrooms responded on the TMR Performance Profile for two consecutive years. Results are shown in Table 31.

TABLE 31
Proportions of Explained Variance of Three Variable Sets on TMR Performance Profile Gains After Partitioning
(Total RSQ = 0.3225)

	Variable Set 1	2	3
Unique to Set 1	.2437		
Unique to Set 2		.1420	
Unique to Set 3			.0039
Common to 1 and 2	-.0671	-.0671	
Common to 2 and 3		.0033	.0033
Residual Effects	-.0033	-.0033	-.0033

Here school effects account for 32 per cent of the gain score variance. Again, pretest scores account for the greatest amount of variance as one might expect. A very strong suppression effect is seen between variable sets 1 and 2. This could possibly be attributed to IQ, age or school instructional policy. Cost does not appear to be a source of gain prediction at all for the TMR group. Perhaps achievement gains are too far removed from cost factors in some special education programs.

3. PH

General. The commonality analysis of PH two-year gain scores, using the three specified variable sets, accounted for 15 per cent ($p = 0.6462$) of the Vineland gain score variance, 11 per cent ($p = 0.7942$) of the WRAT reading gain score variance, 34 per cent ($p = 0.0881$) of the WRAT spelling gain score variance, and 26 per cent ($p = 0.2331$) of the WRAT arithmetic gain score variance. Little effect for the Vineland and WRAT reading gain is seen for these variable sets; as such they are incomplete for these subject areas for this group.

For the PH group the Vineland scale correlated moderately and positively with the WRAT subscales, though not nearly as high as for the EMR group. For this group, then, the social and academic scales are measuring differing constructs.

Vineland Gains. A sample of 32 PH classrooms responded to the Vineland scale. Results are found in Table 32.

TABLE 32
Proportions of Explained Variance of Three Variable Sets on Vineland Gains for PHs after Partitioning
(Total RSQ = 0.1456)

	Variable Set 1	2	3
Unique to Set 1	.0018		
Unique to Set 2		.1244	
Unique to Set 3			.0549
Common to 1 and 3	.0054		.0054
Common to 2 and 3		-.0330	-.0339
Common to 1, 2 and 3	0.0074	-.0074	-.0074

There are no contributions above significance at the $\alpha = .05$ level. There is some overlap between variable sets 1 and 2 with the negative value due to a suppressor effect, since all cost-with-quality correlations are moderately positive.

The negligible pretest contribution is particularly puzzling here; additional background variables must account for the missing influence, yet Vineland pretest scores correlate negatively with most other variables (for instance, -0.4818 with INSSETO). Quality is the greatest unique contributor to gain score variance; and cost is slightly related to gain score variance. No unique contributions are significant at the $\alpha = .05$ level; and the tested school effects, in general, seem to exert little influence on social gain scores. The influential variables for this group are yet to be identified.

Gain score and pretest score correlate -0.1383, indicating regression or ceiling effects. For secondary schools only Vineland gain correlates with chronological age -0.6826, indicating a ceiling effect is at work here.

Reading Gains. Reading gain score analyses for the PH group are inconclusive. Results for a 32 PH classroom sample are presented in Table 33.

TABLE 33
Proportions of Explained Variance of Three Variable Sets on Reading Gains for PHs after Partitioning
(Total RSQ = 0.1095)

	Variable Set 1	2	3
Unique to Set 1	.0004		
Unique to Set 2		.0531	
Unique to Set 3			.0373
Common to 1 and 2	.0011	.0011	
Common to 2 and 3		.0183	.0183

In general, it may tentatively be concluded that the variable sets examined are not the most influential ones possible. A check of simple correlation coefficients shows IQ and chronological age to account for more of the reading gain variance than do quality and cost. None of the variable set contributions approach significance; however, the same patterns do appear -- almost no contributions for pretest, the largest contributions for quality, and a very small contribution for cost. There is a relatively large overlap of variable sets 2 and 3.

Spelling Gains. A sample of 32 PH classrooms responded to the WRAT spelling subtest two consecutive years. Results are presented in Table 34.

TABLE 34
Proportions of Explained Variance of Three Variable Sets on Spelling Gains for PHs after Partitioning (Total RSQ = 0.3357)

	Variable Set 1	2	3
Unique to Set 1	.0383		
Unique to Set 2		.3150	
Unique to Set 3			.0004
Common to 1 and 2	-.0267	-.0267	
Common to 2 and 3		.0058	.0058

Almost all the explained variance is attributed to quality of instruction. Negligible cost contributions and very small pretest contributions are observed. The uniqueness (0.3150) contributed by set 2 is significant at the $\alpha = .05$. A high overlap between variable sets 1 and 2 is seen and some moderately high positive correlations between pretest and quality are found (0.05064 with INTCLATO). Reading gain and spelling gain for the PH group correlate at 0.4643, and spelling gain with arithmetic gain correlates 0.4788.

Spelling pretest and gain scores correlate -0.1208 suggesting that a regression effect may be present. A correlation of -0.3760 between spelling gain and chronological age also suggests a ceiling effect. There appears to be no statistical relationship with IQ.

Arithmetic Gains. A sample of 32 PH classrooms responded to the WRAT arithmetic subtest two consecutive years. Results are presented in Table 35.

TABLE 35
Proportions of Explained Variance of Three Variable Sets on Arithmetic Gains for PHs after Partitioning (Total RSQ = 0.2590)

	Variable Set 1	2	3
Unique to Set 1	.0043		
Unique to Set 2		.2406	
Unique to Set 3			.0628
Common to 1 and 3	-.0033		-.0033
Common to 2 and 3		-.0457	-.0457

None of these contributions is significant at $\alpha = .05$. The quality of instruction accounts for almost all the explained variance. For the PH group reading, spelling and arithmetic gain score partitioning follows the same pattern, although reading has much less variance explained. Arithmetic gains correlate with all the quality indicators in a positive moderate manner (0.38 with INSPROTO, 0.24 and INSETTO, 0.34 with ADMSUPTO and 0.19 with INCLATO). Pretest and gain scores do not correlate for arithmetic. A suppressor variable is responsible for the negative common contribution of variable sets 2 and 3.

4. SED

General. For the SED group the three specified variable sets accounted for 14 per cent ($p = 0.7635$) of the Vineland gain score variance, 27 per cent ($p = 0.3121$) of the WRAT reading gain score variance, 15 per cent ($p = 0.7121$) of the WRAT spelling gain score variance, and three per cent ($p = 0.9933$) of the WRAT arithmetic gain score variance.

Overall, less conclusive results are obtained for the SED group than for other exceptionality groups.

Vineland Gains. A sample of 28 SED classrooms responded to the Vineland instrument. Results are shown in Table 36.

TABLE 36
Proportions of Explained Variance of Three Variable Sets on Vineland Gains for SEDs after Partitioning
(Total RSQ = 0.1365)

	Variable Set		
	1	2	3
Unique to Set 1	.0582		
Unique to Set 2		.0452	
Unique to Set 3			.0004
Common to 1 and 2	.0266	.0266	
Common to 1 and 3	.0511		.0511
Common to 1, 2 and 3	-.0446	-.0446	-.0446

None of the above contributions is significant at $\alpha = .05$. The above results are especially disappointing for the socially and emotionally disturbed group. It would be hoped that significant school effects would be identified by the Vineland scale for this group. It is interesting to note that the Vineland pretest correlated 0.68 with the reading pretest, 0.67 with the spelling pretest and 0.81 with the arithmetic pretest; yet, Vineland gains correlate -.04 with reading gains, 0.21 with spelling gains, and -0.31 with arithmetic gains. The reason for these correlations must be studied very carefully--if the gain score correlations are due to larger gains in social scores than cognitive scores, SED programs may be viewed as "successful" since cognitive gains seem acceptable. If, however, cognitive gains outweigh social gains, a less favorable interpretation may or may not be warranted. Some caution is due because of the differing score metrics involved (correlation of WRAT grade equivalents with Vineland raw score gains). Also disturbing is the low overall R^2 for SED Vineland gains and the observation of higher contributions for pretest than school effects.

The high negative common contributions of variable sets 1, 2 and 3 is unusual and difficult to interpret. Perhaps the correlation between Vineland pretest and gain score (-0.30) is responsible. Further, Vineland gain with chronological age correlates (-0.39) yet only 0.15 with IQ. This may account for the relatively low amount of explained variance produced by the variable sets.

Reading Gains. A sample of 28 SED classrooms responded to the WRAT reading subscale with results shown in Table 37.

TABLE 37
Proportions of Explained Variance of Three Variable Sets on Reading Gains for SEDs after Partitioning
(Total RSQ = 0.2664)

	Variable Set 1	2	3
Unique to Set 1	.0446		
Unique to Set 2		.1381	
Unique to Set 3			.0748
Common to 1 and 2	-.0120	-.0120	
Common to 2 and 3		.0302	.0302
Common to 1, 2 and 3	.0204	.0204	.0204

None of the above contributions is significant at $\alpha = .05$. For the SED, as with other exceptionalities, the quality of instruction accounts for the majority of the explained variance followed by cost and pretest. The negative common contributions of sets 1 and 2 are due to all negative correlations between pretest and quality indicator scores. Cost and pretest (sets 1 and 3) also correlate negatively. Variable set 2 and 3 correlations hide a difference of INTCLATO from other quality indicator relationships.

Pretest reading scores correlate very highly with all other pretest scores, but reading gains correlate much lower with other gains and negatively with Vineland gains. All SED gain scores correlate negatively with chronological age (-0.31 for reading) and positively with IQ (0.35 for reading). Cost and gain correlate 0.31.

Adding the unique and common contributions is most favorable to variable sets 2 and 3--the school effects overlap relatively highly for the reading gain score variance. The reading pretest and gain scores correlate 0.15, yet the gain-age correlation of -0.31 still suggests a ceiling effect.

Spelling Gains. A sample of 28 SED classrooms responded to the WRAT spelling subscale, yielding the results presented in Table 38.

TABLE 38
Proportions of Explained Variance of Three
Variable Sets on Spelling Gains
for SEDs after Partitioning
(Total RSQ = 0.1510)

	Variable Set 1	2	3
Unique to Set 1	.0333		
Unique to Set 2		.0420	
Common to 1 and 2	-.0139	-.0139	
Common to 1 and 3	.0269		.0269
Common to 2 and 3		.0562	.0562
Common to 1, 2 and 3	-.0178	-.0178	-.0178

No contributions are significant at $\alpha = .05$. Again, quality of instruction accounts for most of the gain score variance, followed by pretest and cost. School effects (2 and 3) are better put in context by combining unique and common contributions. Spelling pretest and gain scores correlate -0.42. A ceiling effect seems to be active here in addition to possible regression toward the mean. The joint negative contribution of sets 1 and 2 is due to all negative correlations between pretests and quality indicators. Spelling and reading gains correlate 0.48 as expected.

Arithmetic Gains. A sample of 28 SED classrooms responded to the WRAT arithmetic subscale with results given in Table 39.

TABLE 39
Proportions of Explained Variance of Three
Variable Sets on Arithmetic Gains
for SEDs after Partitioning
(Total RSQ = 0.0299)

	Variable Set 1	2	3
Unique to Set 1	.0049		
Unique to Set 2		.0199	
Unique to Set 3			.0002
Common to 1 and 2	.0046	.0046	
Common to 1 and 3	.0022		.0022
Common to 1, 2 and 3	-.0019	-.0019	-.0019

The task here is to suggest reasons why no variance is explainable in terms of the specified variable sets, although the contributions shown above do follow patterns similar to previous analyses. Adding to the puzzle are the correlations between gain and IQ (0.18) and gain and chronological age (-0.03). In fact, arithmetic gains for the SED groups does not correlate even moderately with any other variable, including pretest (0.10). While some variable suppression is evident, nothing obvious would account for the observed extreme suppression. Perhaps the variable sets need to be greatly expanded for this one particular group--a notion which is not practical.

5. BI

General. The commonality analysis of BI two-year gain scores using the three specified variable sets accounted for 49 per cent ($p = 0.1257$) of the Vineland gain score variance, 26 per cent ($p = 0.6185$) of the WRAT reading gain score variance, 30 per cent ($p = 0.0074$) of the arithmetic gain score variance. The BI group in general seems most sensitive to the variable sets in this study. The Vineland gain scores correlate 0.29 with reading gain scores, 0.16 with spelling gains and -0.01 with arithmetic gains. Why this should be so is uncertain. The Vineland does not correlate as well with the cognitive measures as do the cognitive measures among themselves.

Vineland Gains. A sample of 20 BI classrooms responded to the Vineland scale, producing the results summarized in Table 40.

TABLE 40
Proportions of Explained Variance of Three Variable Sets on Vineland Gains for BIs after Partitioning
(Total RSQ = 0.4903)

	Variable Set 1	2	3
Unique to Set 1	.1615		
Unique to Set 2		.3323	
Unique to Set 3			.0923
Common to 1 and 2	-.0507	-.0507	
Common to 1 and 3	.0399		.0399
Common to 2 and 3		-.0591	-.0591
Common to 1, 2 and 3	-.0261	-.0261	-.0261

None of the contributions is significant at $\alpha = .05$. The unique values far outvalue the common values, yet overlapping is quite evident here. Variable sets 1 and 2 do not correlate negatively but variable sets 2 and 3 do. Hence, a suppressor variable appears present for variable sets 1 and 2. The BI pattern for Vineland gains follows the previous patterns--variable set 2 contributes most to the explained variance, followed by pretest and cost. However, for the BI group pretest and cost contributions are not negligible. For this group the quality indicators correlate rather highly among themselves.

The Vineland gain with pretest score correlations is -0.35; this suggests regression or ceiling effects. Over all combinations BI Vineland gain with chronological age correlates -0.20, indicating a ceiling effect.

Reading Gains. A sample of 20 BI classrooms responded to the WRAT subscale, yielding the data presented in Table 41.

TABLE 41
Proportions of Explained Variance of Three
Variable Sets on Reading Gains
for BIs after Partitioning
(Total RSQ = 0.2583)

	Variable Set 1	2	3
Unique to Set 1	.0337		
Unique to Set 2		.1997	
Unique to Set 3			.1156
Common to 1 and 2	-.0335	-.0335	
Common to 1 and 3	-.0303		-.0303
Common to 2 and 3		-.0806	-.0806
Common to 1, 2 and 3	.0557	.0557	.0557

None of the above contributions is significant at $\alpha = .05$. Variable sets 2 and 3 account for most of the contribution, but there is a large overlap of these sets. This is due to moderately high negative correlations between reading gain and each of the quality indicators. This is difficult to interpret from a statistical viewpoint. Apparently, variable sets 2 and 3 enjoy a common correlation with a third factor which is unidentified. Overlap of sets 1 and 2 as well as sets 1 and 3 can also be observed. The negligible pretest effect is puzzling.

Reading pretest with gain score correlates 0.16. While low, it is in the expected direction.

Spelling Gains. A sample of 20 BI classrooms responded to the WRAT spelling subscale with the results shown in Table 42.

TABLE 42
Proportions of Explained Variance of Three
Variable Sets on Spelling Gains
for BIs after Partitioning
(Total RSQ = 0.2964)

	Variable Set 1	2	3
Unique to Set 1	.0010		
Unique to Set 2		.2843	
Unique to Set 3			.0283
Common to 1 and 2	.0056	.0056	
Common to 1 and 3	.0106		.0106
Common to 2 and 3		-.0281	-.0281
Common to 1, 2 and 3	-.0052	-.0052	-.0052

Almost all the explained variance is attributed to quality of instruction for spelling gains. Spelling skills for the BI group seem to be more associated with school than with home environment, as were reading gains. In fact, reading gains and spelling gains correlate 0.5682 for the BI group.

While none of the above contributions is statistically significant at $\alpha = .05$, these contributions are not directly comparable to other exceptionality groups with larger sample sizes. For instance, the uniqueness of variable set 2 is certainly significant and might also be statistically significant were the sample size increased from 20.

The very small contributions of sets 1 and 3 are offset even more by their negative common contributions. The negative common contributions of sets 2 and 3 stem from negative correlations among all quality indicators and cost. There is also a negative correlation between cost and spelling gains. Spelling pretest and gain scores correlate 0.1093; however, a ceiling or regression effect is still a possibility since spelling gain and chronological age correlate -0.3642. Also, IQ and spelling gain correlate 0.5293 which is significant at $\alpha = .01$. This significant relationship helps hold down school effects in general.

Arithmetic Gains. A sample of 20 BI classrooms responded to the WRAT arithmetic subscale with results presented in Table 43.

TABLE 43
Proportions of Explained Variance of Three Variable Sets on Arithmetic Gains for BIs after Partitioning
(Total RSQ = 0.6993)

	Variable Set 1	2	3
Unique to Set 1	.1785		
Unique to Set 2		.2195	
Unique to Set 3			.1309
Common to 1 and 2	.0806	.0806	
Common to 1 and 3	.2352		.2352
Common to 2 and 3		-.0919	-.0919
Common to 1, 2 and 3	-.0535	-.0535	-.0535

Although variable set 2 uniqueness is the greatest, it is not significant at $\alpha = .05$, as are variable sets 1 and 3. This is due to the higher degree of freedom associated with variable set 2 (there are four quality indicators). The negative overlap between sets 2 and 3 stems from moderately high negative correlations between cost and quality indicators for the BI group. However, arithmetic gains and quality correlate positively (0.32 for INSPROTO, 0.13 for INSSETTO, 0.25 for ADMSUPTO, and 0.12 for INCLATO). Cost and gain correlate 0.66 and gains with chronological age correlate positively (0.37). Arithmetic gains also correlated less intensely with IQ for the BI group than with other other cognitive measures, leaving more variance to be accounted for by these specific school effects. There seem to be no ceiling or regression effects here which may produce the much higher R^2 for arithmetic than the other three BI scales observed.

SPECIAL EDUCATION

Quality, Cost and Student Progress

A SUMMARY

EC 110 741

Bureau of Information Systems
Pennsylvania Department of Education
April 1978

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BACKGROUND

The Pennsylvania Department of Education has completed a two-year, intensive, large-scale research study of five major special education programs. This study involved testing students and observing special education classrooms. For example, in the first year (1975) of the study the Department of Education tested about 3,900 students and observed 388 classrooms as a statewide representative sample. The second year the department was able to evaluate about 2,300 of the same students and 300 classrooms for the following types of children:

Educable Mentally Retarded (EMR)--Included in this category are those retarded children with an I.Q. range of 55-80. Such children suffer from retarded mental development and exhibit impaired adaptive behavior in learning, maturation or social adjustment.

Trainable Mentally Retarded (TMR)--Included in this category are retarded children with an I.Q. range of 25-55. They also, as do the EMR's, exhibit impaired adaptive behavior in learning, maturation and social adjustment, but the degree of severity is greater, as the I.Q. range indicates.

Physically Handicapped (PH)--This category includes those children with orthopedic disabilities and/or other mild-to-profound health impairments in such areas as speech, hearing or vision. These conditions are of such magnitude that they limit the educational performance and normal classroom accommodation of the child.

Socially and Emotionally Disturbed (SED)--This category is made up of those children who exhibit sufficient emotional and atypical social behavior to require special placement. Their deviate behavior may range from overt destruction to withdrawal from reality. These emotional difficulties may result in educational deficits.

Brain Injured (BI)--The children in this category are learning disabled because of deficiencies in the acquisition of basic skills such as reading, writing, spelling and arithmetic. They may have neurological brain damage, but their learning problems are not primarily the result of mental retardation, physical handicaps or emotional factors.

TABLE 1

DESCRIPTION OF SAMPLE

Exceptionality	No. of Students	Average Age	Average No. Yrs. in Spec. Ed.	Average I.Q.
EMR Elementary	573	11.58	4.18	68.73
EMR Secondary	593	16.50	6.75	69.29
TMR Elementary	281	12.22	5.54	43.51
TMR Secondary	188	17.61	9.50	40.29
PH Elementary	147	11.53	4.98	79.32
PH Secondary	83	16.80	8.35	75.25
SED Elementary	121	11.31	2.95	94.79
SED Secondary	78	15.97	3.83	90.39
BI Elementary	137	11.07	2.90	92.21
BI Secondary	107	14.66	3.99	90.97

OBJECTIVES

The major reason for the study was to measure and analyze three critical areas: (1) learning outcomes of students, (2) quality of special education programs and (3) costs associated with the administration and operation of special education.

Further research was placed on gaining insights into the relationship among the student learning outcomes, quality of programs and costs. For example, do good quality programs consistently contribute to student learning outcomes and do good quality programs necessarily call for higher costs?

MEASUREMENT OF OBJECTIVES

Basic Skills--The Wide Range Achievement Test (WRAT) was used to assess progress in basic skills for all children in the study except TMR's. This instrument, appropriate for use with children of extremely varying ability levels, provides in a relatively short period of testing time measures of three basic cognitive skills: (1) reading, (2) spelling and (3) arithmetic.

For the TMR children the WRAT was considered inappropriate. Therefore, the TMR Performance Profile (TMR PP) was used with this category. This instrument uses a checklist to allow someone familiar with the individual child, usually the teacher, to identify the child's performance level on 240 items which assess six major areas: (1) social behavior, (2) self-care, (3) communication, (4) basic knowledge, (5) practical skills and (6) body usage. For this study the instrument was scored to give one total indicator of performance.

Social Competency--The instrument used to assess this characteristic for all children was the Vineland Social Maturity Scale. This measure, like the TMR PP uses a checklist to allow someone familiar with the child to report competence on 117 items covering six areas: (1) self help, (2) locomotion, (3) occupation, (4) communication, (5) self-direction and (6) socialization. The instrument can be scored to produce a measure of "social age."

Quality of Programs--This variable was measured by the Indicators of Quality instrument, developed especially for this study. Combining both observation and interview techniques, the measure contains 38 items which are scored to yield four subscale scores and a total summary score. The four subscales are: (1) Instructional Process, (2) Instructional Setting and Programs, (3) Administrative Support, and (4) Integration with regular Classroom.

In both years of the study, the observers/interviewers who used the Indicators of Quality underwent common training to assure inter-judge reliability. These training sessions included familiarization with the instrument, discussion of criteria for assessing individual items, suggested interview techniques, general rating procedures and, finally, practice in special education classrooms.

Each of the 38 items was rated on a scale of one (the lowest rating) to five (the highest).

Costs--The department collected and analyzed budget line item costs for each type of exceptionality at the elementary and secondary levels. Average class costs per school district and intermediate unit for each exceptionality were adjusted by actual teacher salaries to obtain a more accurate cost for each classroom. Although collecting actual cost for each classroom may be theoretically feasible, the department found this to be impractical.

HIGHLIGHTS OF RESEARCH FINDINGS

Learning Outcomes of Students--Student attainment in social competencies and basic skills was generally very impressive. For example, the average educable mentally retarded student at the secondary level gained close to four years in social maturity, while the average socially and emotionally disturbed student gained about three years during the two-year study period. Generally, the social maturity gains at the elementary level were less than the secondary level but the average social gain amounted to the two years expected for the nonhandicapped.

Basic skill gains were also impressive, despite the fact that these students have different levels of handicap. For example, the I.Q. level of EMR students ranged from 55 to 80, while TMR students were in the 25 to 55 I.Q. range.

Tables 4 and 5 (See pgs. 5 and 6) summarize the learning gains.

Quality of Special Education Programs--The overall rating of quality was 3.6 in 1976 and 3.84 in 1977, so the quality of special educatio in the Commonwealth is good.

TABLE 2

INDICATORS OF QUALITY RESULTS
(Average Ratings on 5-Point Scale)

Scale	1976 Ratings	1977 Ratings
Instructional Process	3.68	3.93
Instructional Setting	3.58	3.78
Administrative Support	3.89	4.12
Integration (Mainstreaming)	2.94	3.28
Total	3.60	3.84

Costs-- Costs vary considerably. For example, TMR elementary costs per class range from $21,140 to $45,230. Such differences appear to be due to variations in class size and to teacher salaries that reflect differences in geography, population density and socioeconomic climate.

Researchers also compared costs of special education with costs of regular education. For example, Table 3 indicates it costs 2.38 times as much to educate an elementary educable retarded student as it does to educate a regular elementary student.

TABLE 3

SPECIAL EDUCATION COST INDICES

Exceptionality	Elementary		Secondary		Total	
	1974-75	1975-76	1974-75	1975-76	1974-75	1975-76
EMR	2.38	2.10	1.66	1.64	1.83	1.71
TMR	3.43	3.39	2.00	2.21	2.50	2.56
SED	4.45	4.76	2.87	3.31	3.41	3.71
PH	3.64	4.17	3.25	3.18	3.08	3.36
BI	3.53	3.62	1.82	2.58	2.67	2.88

Relationships--Collectively pretest scores (fall 1975), quality and costs related significantly to two-year gains in social maturity for the educable mentally retarded and trainable mentally retarded. The combined effect of pretest scores, quality and cost related significantly to gains for TMR's on the performance profile. Pretest scores contributed significantly to gains for EMR's in arithmetic and spelling. Quality of instruction significantly contributed to educable mentally retarded and the physically handicapped spelling gains. In addition, costs and pretest scores significantly related to brain injured arithmetic gains.

Overall, quality of instruction had a greater influence on gains than did costs or pretest scores. Costs of instruction had little direct explainable influence on student progress, and costs did not relate consistently with quality, pretest scores or posttest results. This difficulty in explaining the relationship of costs to quality of instruction and student progress should not be allowed to overshadow the results which clearly documented the consistently significant gains in student learning and social maturity.

SUMMARY

The Department of Education's research indicates that special education students, for the most part, are making significant progress in both social competencies and basic skills.

The quality of special education programs is generally good. On a scale of 1 (low) to 5 (high) the average combined rating of instructional process, instructional setting, administrative support and efforts to mainstream the handicapped with the nonhandicapped was 3.8.

On the other hand, cost of administering and operating special education programs varies a lot, and it does cost two to four times more than regular education.

A detailed technical report in limited quantity is available from the Division of Research, Bureau of Information Systems, Pennsylvania Department of Education, Box 911, Harrisburg, PA 17126.

Table 4

Social and Cognitive Classroom Gains
Elementary Pupils

Achievement	Fall 1975 Average	Spring 1977 Average	Gain	N[a]
	I. Socially and Emotionally Disturbed			
Social Age	9.20	11.50	2.30[b]	110
Reading	3.23	4.73	1.53[c]	104
Spelling	2.85	4.00	1.16	102
Arithmetic	3.10	3.98	0.97	102
	II. Brain Injured			
Social Age	9.70	11.80	2.10	132
Reading	2.78	3.95	1.19	135
Spelling	2.52	3.64	1.13	136
Arithmetic	2.98	3.97	1.07	127
	III. Physically Handicapped			
Social Age	6.80	8.00	1.20	134
Reading	2.50	3.56	1.15	130
Spelling	2.25	3.85	1.65	126
Arithmetic	2.30	3.22	1.02	126
	IV. Educable Mentally Retarded			
Social Age	8.50	10.40	1.90	530
Reading	1.93	2.63	0.74	525
Spelling	1.92	2.60	0.73	578
Arithmetic	2.07	2.84	0.82	524
	V. Trainable Mentally Retarded			
Social Age	4.80	6.40	1.60[d]	260
TMR Profile	391.90	492.70	98.50	274

[a]Represents the number of same pupils tested each time for gain score computation.

[b]2.30 equals 2 years, 3 months average gain in social age between the fall of 1975 and the spring of 1977.

[c]1.53 is a grade equivalent score average gain of slightly over 1 year, 5 months between the fall of 1975 and the spring of 1977.

[d]98.50 represents an average raw score gain of about 25 per cent on the TMR Performance Profile between the fall of 1975 and the spring of 1977.

Table 5

Social and Cognitive Classroom Gains
Secondary Pupils

Achievement	Fall 1975 Average	Spring 1977 Average	Gain	N[a]
I. Socially and Emotionally Disturbed				
Social Age	14.10	16.80	2.70[b]	69
Reading	6.14	7.13	1.10[c]	70
Spelling	5.17	5.92	0.83	69
Arithmetic	5.00	5.98	1.16	68
II. Brain Injured				
Social Age	14.40	16.10	1.70	87
Reading	4.15	5.10	1.01	87
Spelling	3.56	4.13	0.72	78
Arithmetic	4.29	5.41	1.21	84
III. Physically Handicapped				
Social Age	8.40	9.90	1.50	78
Reading	5.02	5.99	0.93	71
Spelling	4.45	5.32	0.94	67
Arithmetic	4.12	5.10	1.12	64
IV. Educable Mentally Retarded				
Social Age	13.60	17.30	3.70	560
Read .ng	3.75	4.30	0.60	507
Spelling	3.70	4.24	0.62	456
Arithmetic	3.82	4.45	0.74	476
V. Trainable Mentally Retarded				
Social Age	7.50	8.30	0.80	139
TMR Profile	495.70	579.50	88.29[d]	177

[a] Represents the number of same pupils tested each time for gain score computation.

[b] 2.70 equals 2 years, 7 months average gain in social age between the fall of 1975 and the spring of 1977.

[c] 1.10 is a grade equivalent score average gain of one year, one month between the fall of 1975 and the spring of 1977.

[d] 88.29 represents an average raw score gain of over 12 per cent on the TMR Performance Profile between the fall of 1975 and the spring of 1977.